

U.S. CHEMICAL SAFETY BOARD

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US INK/MILLARD REFRIGERATED SERVICES

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PUBLIC MEETING

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THURSDAY,
JANUARY 15, 2015

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U.S. CHEMICAL SAFETY BOARD MEMBERS PRESENT:

RAFAEL MOURE-ERASO, Ph.D., Chairperson,
U.S. Chemical Safety Board
MANNY EHRLICH, JR., Member, U.S. Chemical
Safety Board
MARK GRIFFON, Member, U.S. Chemical Safety
Board

STAFF PRESENT:

RICHARD C. LOEB, General Counsel
JOHNNIE BANKS, CFEI, Investigations Supervisor
LUCY TYLER, CSP, Investigator
BEETA LASHKARI, Attorney/Investigator
MICHAEL CORONA, Attorney/Investigator
RICHARD GUNARATNAM, Investigator
SAMUEL OYEWOLE, Ph.D., Investigator
REEPA SHROFF, Investigator

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by the U.S. Chemical Safety Board.

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(Time not provided)

CHAIRPERSON MOURE-ERASO: Good evening
and welcome to this public meeting of the U.S.
Chemical Safety Board, the CSB.

First of all, I would like to call
your attention to the agenda that everybody
should have. There are copies in the front. As
you can see, today we have a composite meeting in
which we are covering two of our products that
are in investigations. You can read the contents
of the agenda.

We have opening statements. And first
we are going to make a presentation of the
Millard Refrigerated Services Safety Bulletin.
That is the issue of anhydrous ammonia. Then we
are going to have the Board asking questions to
the investigators after the presentation. And
then we are going to have public comment of
anybody that wants to come to that microphone and
speak. After that we are going to have a Board
vote on the acceptance of the safety bulletin of

1 Millard Industries.

2 After that presentation we are going
3 to have a short break and we reconvene. If we
4 are able to do it early, we'll do it early, but I
5 will be telling you the time. And then we are
6 going to have a presentation on the US Ink case
7 of East Rutherford here in New Jersey. That has
8 to do with combustible dust. Again, there will
9 be more questions particularly on the US Ink case
10 to the investigative team, investigatory team.
11 Then there are going to be public comments on the
12 report and following again by a Board vote
13 specifically for the US Ink study.

14 Then there will be a closing statement
15 and that will be the end of our meeting.

16 So to get us started I am Rafael
17 Moure-Eraso, the Chairperson of the Board. And
18 with me today are Board Members Mark Griffon and
19 Manny Ehrlich, Jr. to my left. Also joining me
20 here to my left is our general counsel, Richard
21 Loeb. And here you'll have a number of CSB staff
22 members including all the members of the two

1 investigative teams, the one in Millard
2 Industries and the one in US Ink. They are here
3 for the agency. Besides that we have all our
4 communication staff that are the ones that
5 organized and prepared this meeting.

6 As probably you all know, the CSB is
7 an independent non-regulatory federal agency that
8 investigates serious chemical accidents. The
9 investigations examine all aspects of chemical
10 accidents including physical causes related to
11 equipment design as well as inadequate
12 regulations, industry standards and safety
13 management systems. Ultimately, we use
14 recommendations or findings that are designed to
15 prevent similar accidents.

16 At this time I would like to recognize
17 representatives from the U.S. Congress and the
18 U.S. Senate that represent this district that are
19 present here. With us is a Representative of
20 Congressman Pascrell, and also I believe
21 representatives from Senator Booker and Senator
22 Menendez. If the representative for Congressman

1 Pascrell would like to address the audience, I
2 invite him to please approach this microphone in
3 the front.

4 (No audible response)

5 CHAIRPERSON MOURE-ERASO: If he's not,
6 I ask for the representative of Senator Booker if
7 he would like to say some words. Please.

8 PARTICIPANT: Just briefly. First of
9 all, welcome and thank you for being here in New
10 Jersey on behalf of Senator Booker this evening.
11 We thank you for your work particularly on the
12 report involving the US Ink incident in 2012.
13 And for those who don't know, today Senator
14 Booker did release a statement regarding a letter
15 he wrote to OSHA echoing concerns and
16 recommendations of the report that there be a
17 standard for combustible dust.

18 So other than that I have some of
19 those materials. I can leave some on the table
20 in the back. But again, thank you for being here
21 today.

22 CHAIRPERSON MOURE-ERASO: Thank you.

1 Thank you very much.

2 If the representative of Senator
3 Menendez would like to address the audience?

4 (No audible response)

5 CHAIRPERSON MOURE-ERASO: No? Okay.

6 So we'll proceed. The purpose of today's meeting
7 is to present two investigative reports. The
8 first is a safety bulletin on anhydrous ammonia
9 and addresses the release in a company called
10 Millard Refrigerated Services from Mobile,
11 Alabama. The second is a case study and it is a
12 combustible dust explosion that occurred right
13 here, or nearby in East Rutherford, New Jersey at
14 the US Ink facility.

15 The safety bulletin that is entitled,
16 "Key Lessons for Preventing Hydraulic Shock in
17 Industrial Refrigeration Systems" addresses the
18 design safety operations of ammonia refrigeration
19 facilities. The CSB believes that if ammonia
20 refrigeration facilities follow the key lessons
21 learned that we present in the report from this
22 Millard safety bulletin, first, dangerous

1 hydraulic shock events can be avoided that are
2 not clear sometimes that they could occur in this
3 industry, environmental damage could be
4 prevented, and potential fatalities and injuries
5 will also be prevented.

6 We think that the lessons learned in
7 the Millard investigations are relevant to many
8 anhydrous ammonia facilities in the U.S.
9 including many that operate in the State of New
10 Jersey.

11 The second investigation is a case
12 study on the explosion and flash fires that
13 occurred at the US Ink manufacturing facility
14 nearby in East Rutherford, New Jersey. This
15 incident occurred in October 9, 2012. Seven
16 workers suffered burn injuries when they gathered
17 at the entrance to the ink mixing room. As a
18 result of the CSB finding, the Board is
19 considering recommendations to OSHA and the State
20 of New Jersey.

21 Before we begin I'd like to introduce
22 the CSB's recently-confirmed Board member, Mr.

1 Manny Ehrlich, Jr. I know he doesn't kind of
2 feel comfortable with this, but because of the
3 pressures that we got in the Federal Government
4 he is the Honorable Manny Ehrlich, Jr. now. He
5 hails from this state of New Jersey and he is
6 participating today in his first CSB public
7 meeting. Mr. Ehrlich joins the CSB after decades
8 of working in the chemical industry and most
9 recently running his own consulting business.

10 Additionally, Mr. Rick Engler will be
11 joining us in the Board. I don't believe he's
12 here today. Is he here today?

13 (No audible response)

14 CHAIRPERSON MOURE-ERASO: But he will
15 be taking his place on the Board in the middle of
16 January. So he is not with us. I'm sorry, the
17 middle of February. They corrected here. I
18 think it's the 16th of February. I truly look
19 forward to working with both of the new Board
20 members and with Mr. Griffon on a new
21 reconstituted Board.

22 Lastly, I also would like to

1 acknowledge the late Senator Lautenberg.
2 Following the 2012 incident at US Ink the senator
3 formally asked the CSB to become involved in this
4 investigation. The senator requested in October
5 2012 for the deployment of the CSB to investigate
6 the fire and explosion at US Ink in East
7 Rutherford. His request is a reflection of his
8 lifetime concern for the well-being of the New
9 Jersey's workers and the communities in New
10 Jersey.

11 He had stated in his letter to the CSB
12 requesting our deployment, quote, "Working with
13 chemicals should not carry an unreasonable risk
14 of injury and hurt." And that is a moral that he
15 live for all through his life as a senator of the
16 United States.

17 Senator Lautenberg was a great leader
18 and an ardent supporter of work place safety and
19 environmental protection. Among his many
20 legacies was working to establish, to fund and to
21 sustain the U.S. Chemical Safety Board. He is
22 widely considered to be the father of the agency.

1 We can enter now into business.

2 Please take a moment to note the locations of the
3 exits from this meeting room. In case of an
4 emergency there is the exit on the back where you
5 enter and there is another exit through that
6 curtain, if need be. So there are two exits.

7 I also ask that you please mute your
8 cell phones so that the proceedings are not
9 disturbed.

10 Next I would like to acknowledge the
11 CSB investigation team who will be presenting the
12 draft report to us today. They will describe
13 their findings into these two investigations.
14 After each of the staff presentations, as you can
15 check in the agenda, there will be an opportunity
16 for public comments first for Millard
17 Refrigerated Service on the anhydrous ammonia
18 case, and second in the US Ink on the combustible
19 dust case.

20 If anyone in the audience wishes to
21 comment publicly, please sign up at the entrance
22 in the tables in the check-in area and I will

1 call your name at the appropriate time at the
2 moment of the public comments.

3 Please note that we will have to limit
4 public comments to three minutes. And we would
5 like to request that the comments be relevant to
6 the two investigations being discussed today.

7 I would like to thank the D.C.-based
8 investigative team led by Johnnie Banks that is
9 here with us, the team lead, for their strong
10 commitment and dedication to their work. These
11 teams all under the direction of Mr. Banks were
12 in charge of both of these investigations, the
13 one in Alabama and the one here in New Jersey.

14 And I would also like to thank you,
15 the audience, for being interested in the work of
16 the CSB. I see a lot of familiar faces that have
17 been following our work through the years and I
18 appreciate your coming here and giving comments
19 to improve our work in the future and following
20 us and following the products of the agency.

21 I will now recognize my other Board
22 members for opening statements, and first I would

1 like to ask our newest Board member, Mr. Manny
2 Ehrlich. So, Mr. Ehrlich?

3 MEMBER EHRLICH: Thank you, Mr.
4 Chairman. Good evening. As the Chairman pointed
5 out, I am a native of New Jersey. It's always
6 good to come to a meeting like this and see the
7 faces of some people that I've worked with in the
8 past and it's always nice to have people not ask
9 you what exit you live at in New Jersey.

10 I've got 45 or 50 years of experience
11 in the chemical industry in positions that range
12 from pilot plant manager to plant manager to vice
13 president of health and safety and director of
14 emergency response. My last 25 years have been
15 focused on safety and health issues with
16 particular emphasis on worker safety. I've been
17 involved in several situations during my career
18 where lives have been lost and I'm absolutely
19 committed to take the lessons that I've learned
20 and share them with members of this Board and the
21 chemical community at large to see to it that
22 they never happen again. That's the best I can

1 promise to you, and I will work diligently at
2 that.

3 I'm pleased and proud to be affiliated
4 with an organization like this. This is a fine
5 organization and I make my commitment to you as
6 to well as the people of the United States to
7 work diligently on this Board to help further
8 their commitment to reducing chemical plant
9 incidents and saving lives. Thank you very much.

10 CHAIRPERSON MOURE-ERASO: Thank you,
11 Mr. Ehrlich.

12 Now, Mr. Griffon.

13 MEMBER GRIFFON: Thank you, Chairman.

14 And very nice remarks, Mr. Ehrlich.

15 I want to say we're here tonight
16 discussing two types of incidents that the CSB
17 over the last 15 years has seen with great
18 frequency, combustible dust incidents and ammonia
19 releases.

20 First, with regard to the safety
21 bulletin based on the incident involving an
22 ammonia release at Millard. I believe this

1 report includes some important lessons for all
2 similar industries regarding operation and design
3 of these types of systems, as well as emergency
4 response to releases when they do occur. I
5 believe that in addition to these technical fixes
6 there are also lessons to be learned regarding
7 decision making.

8 I think industry leaders should be
9 asking themselves a couple questions. Do our
10 sites have adequate on-site expertise to operate
11 safely during off normal conditions? How are
12 emergency shutdown decisions made when the
13 company is weighing the potential loss of
14 product; in this case food, against safety and
15 health consequences of an ammonia release? I
16 hope the industrial sector takes away some
17 valuable lessons from this important safety
18 bulletin.

19 With regard to the US Ink incident my
20 remarks are unfortunately going to be very
21 similar to remarks I've made at the Hoeganaes
22 meeting in November 2011 and at the recent AL

1 Solutions meeting in July 2014, two other
2 combustible dust cases that we investigated.

3 At US Ink we have yet another tragedy
4 resulting from a combustible dust explosion, an
5 issue for which the Board since 2006 has
6 recommended that a federal safety standard is
7 needed. It is very troubling that we are here
8 reporting on yet another combustible dust
9 incident and reissuing a recommendation for a
10 federal safety standard. The time for action is
11 way past due. For this Board's part I plan to
12 work with my colleagues on the Board to continue
13 to advocate for the development of such a federal
14 combustible dust standard. Thank you.

15 CHAIRPERSON MOURE-ERASO: Thank you,
16 Mr. Griffon.

17 At this time I would like to introduce
18 the CSB leading investigator on these two
19 investigations, Mr. Johnnie Banks. I will ask
20 him to introduce his team of investigators and to
21 proceed with the presentation of the Millard
22 Refrigerated Services safety bulletin.

1 Mr. Banks?

2 INVESTIGATOR BANKS: Thank you. Mr.
3 Chairman, Board Member Griffon, Board Member
4 Ehrlich, Mr. Loeb, ladies and gentlemen, good
5 evening.

6 The Millard Refrigerated Services
7 investigation team is prepared to present
8 findings and key lessons from our investigation
9 of an anhydrous ammonia release that occurred at
10 the Millard Refrigerated Services facility in
11 Theodore, Alabama on August 23rd, 2010.

12 The release was caused by ruptured
13 piping on the roof inside the Millard facility.
14 As a result of the release 152 members of the
15 public and one Millard employee suffered injuries
16 consistent with ammonia exposure. Thirty-two of
17 those victims were hospitalized and four were
18 placed in intensive care.

19 This evening's presentation will
20 summarize the incident and list key lessons for
21 the ammonia industry to prevent future ammonia
22 releases from a damaging event called hydraulic

1 shock, also known as liquid hammer, that can
2 occur in refrigeration equipment and piping.

3 I'd like to take this opportunity to
4 provide an overview of the agenda for the
5 evening's proceedings. We'll begin with the
6 team's presentation of investigation findings.
7 The team will then entertain questions from the
8 Board. The public will be invited to offer
9 comments. The Board members will then vote on
10 the team's proposed key lessons. And finally, a
11 closing statement from the Chair.

12 And before I start I'd like to
13 introduce the Millard investigative team, which
14 includes myself, Johnnie Banks, supervisory
15 investigator; Ms. Lucy Tyler, investigator; and
16 Beeta Lashkari, attorney/advisory investigator.

17 At the time of the 2010 incident at
18 Millard Refrigerated Services it operated as a
19 refrigerated warehouse and distribution company
20 with 36 facilities in the United States and
21 Canada. The company was headquartered in Omaha,
22 Nebraska. The Millard facility in Theodore,

1 Alabama, the location of the 2010 incident, was a
2 marine export facility that stored, packaged and
3 froze poultry and other meat products. Millard
4 loaded product onto ships docked at the facility
5 for international shipment. And here we have a
6 satellite image of the facility.

7 Now Millard operated a 240,000-square-
8 foot cold storage facility that could store up to
9 24 million pounds of product, mostly frozen
10 poultry and beef. It had storage freezers and
11 three blast freezers that were capable of rapidly
12 freezing product within 24 hours.

13 Now the Theodore facility was located
14 along the Theodore industrial channel that served
15 the Mobile Bay in Alabama. The facility became
16 Millard Maritime in 2013 and the company stopped
17 using cold storage and now stores and exports
18 other products.

19 The ammonia refrigeration system at
20 Millard contained up to 143,000 pounds of
21 anhydrous ammonia. This slide shows a simple
22 depiction of the ammonia refrigeration cycle. In

1 the refrigeration process ammonia is not
2 generated or consumed. It changes phase from a
3 liquid to a gas it moves from heat from the
4 freezer or refrigerated areas. Liquid ammonia
5 absorbs heat as it turns to a vapor and the vapor
6 is then compressed and condensed back into a
7 liquid where it cycles back through the
8 refrigeration process.

9 Now anhydrous ammonia is a very
10 commonly used chemical used in industrial
11 refrigeration as well as many other industries
12 and it is a hazardous material. Ammonia is a
13 colorless gas at a normal temperature with
14 irritating odor. When released to the atmosphere
15 it forms an aerosol with the moisture in the air
16 and produces a visible white cloud. It is
17 irritating to the eyes and respiratory system and
18 at high concentrations can result in death. An
19 explosion or deflagration can occur if ammonia is
20 present in the air at an explosible concentration
21 and an ignition source is nearby.

22 Before we describe the incident, the

1 technical failure at Millard, we'll first briefly
2 describe the purpose and functionality of
3 evaporators in an ammonia refrigeration system.

4 In large refrigeration systems low-temperature
5 liquid ammonia is pumped through evaporator coils
6 located in the cold storage areas and freezers to
7 cool within those respective spaces. Air
8 temperature in the freezer decreases as liquid in
9 the coils transfers to a gas. Over time moisture
10 from the air builds up on the external surfaces
11 and the evaporator coil in the form of frost.

12 If not periodically removed the frost
13 accumulating on the evaporator coil surfaces
14 eventually reduces the evaporator's ability to
15 cool the space. A hot frost defrost cycle is a
16 common technique used to periodically melt the
17 accumulated frost from the evaporator coil
18 surfaces by interrupting the normal cooling mode
19 and circulating hot ammonia gas through the coil
20 to warm the evaporator surface.

21 Now Investigator Tyler will now
22 discuss the evaporating piping configuration and

1 defrost cycle.

2 INVESTIGATOR TYLER: Thank you. Good
3 evening.

4 This figure is a schematic of the
5 evaporator coil and its associated piping. Low-
6 temperature ammonia is fed into the evaporator
7 from the bottom. It evaporates to cool the space
8 and the remaining ammonia gas is removed through
9 a suction valve at the top. At Millard the
10 liquid ammonia was at minus 40 degrees
11 Fahrenheit. When the defrost cycle initiates,
12 low-temperature liquid ammonia is pumped out of
13 the evaporator coils and the coils are void of
14 liquid. This is a crucial step in the process to
15 ensure all cold liquid refrigerant is removed
16 before adding hot high-pressure gas.

17 And to melt the frost on the coils hot
18 gas at 110 degrees Fahrenheit is pumped into the
19 evaporator coil for a short time. The hot gas
20 fed into the coil increases the coil temperature
21 and causes the frost on the surface to melt.
22 After the hot gas melts the frost, the coil is

1 depressurized to remove any of the remaining hot
2 gas and liquid. When this is completed, the
3 liquid fills the coil and the refrigeration
4 process continues. The defrost cycle at Millard
5 was designed to last about 130 minutes.

6 Evaporator piping in ammonia
7 refrigeration systems is susceptible to a
8 damaging hydraulic shock event during the hot gas
9 defrost cycle. This is most common during the
10 transition between the low-temperature liquid and
11 hot gas and can be avoided by proper
12 refrigeration system design and operation.

13 Hydraulic shock is a sudden localized
14 pressure spike that can occur in piping and
15 equipment when there is a sudden change in the
16 velocity of a flowing liquid. It is very common
17 in steam and water systems and often causes an
18 audible hammering and knocking sound in piping.
19 During hot gas defrost evaporator coils
20 containing hot gas are isolated from the low
21 temperature side of the system by control valves.
22 If the defrost cycle is interrupted causing one

1 of the control valves to rapidly open, the hot
2 high-pressure gas can come into contact with the
3 low-temperature ammonia under vacuum.

4 A cause of hydraulic shocks more
5 common in ammonia systems is the rapid opening of
6 a valve from high pressure to low pressure. If
7 the coil rapidly depressurizes, refrigerant
8 liquid and vapor will accelerate into the
9 downstream suction piping leading to a damaging
10 hydraulic shock event. And this is similar to
11 what happened on the day of the Millard release
12 incident.

13 Now I will describe the ammonia
14 release incident that occurred in August 2010.

15 On the evening prior to the ammonia
16 release Millard experienced a loss of electricity
17 for about seven hours. Operators reported
18 experiencing issues with the control system when
19 the refrigeration system got back on line.
20 Immediately before the incident occurred at about
21 8:45 in the morning hot gas defrost was in
22 progress for a group of blast freezer

1 evaporators. At about the same time an operator
2 was troubleshooting alarms in the control system
3 as a result of that power outage.

4 While clearing alarms the defrost
5 cycle on a group of blast freezer evaporators was
6 reset. Due to an error with the programming
7 logic in the control system, the reset triggered
8 the evaporator to automatically go into
9 refrigeration mode without first bleeding hot gas
10 from the coil. The system triggered a valve to
11 open and liquid refrigerant was charged to the
12 coil. This caused the hot gas to rapidly
13 condense and liquid accelerated through the coil
14 and into the suction piping on the roof.

15 Operators became aware of the ammonia
16 release shortly before 9:00 a.m. Millard workers
17 were in the process of loading two international
18 ships with frozen poultry on the docks. An
19 ammonia release occurred inside one of the
20 facility's blast freezers which set off multiple
21 alarm sensors alerting employees. On the right
22 is a photo of the release taken inside the

1 warehouse shortly after the incident occurred.

2 At about the same time a visible cloud
3 of ammonia appeared on the roof of the Millard
4 Refrigerated Services facility from the piping.
5 A large white cloud of ammonia traveled south
6 across the canal in the direction of the wind. A
7 total of 32,100 pounds of anhydrous ammonia was
8 released. And on the left is a photo of the
9 ammonia release on the roof. You will notice a
10 white cloud from the ammonia leaking under the
11 insulation that surrounded the ends of those
12 pipes.

13 Here is a graphic that depicts the
14 ammonia cloud produced by the release. Emergency
15 responders reported to the CSB that the cloud
16 formed on the roof and traveled down the south
17 side of the facility and hovered near the ground
18 as it traveled across the river.

19 On the day of the incident off-site
20 contractors conducting cleanup operations for the
21 Deep Water Horizon oil spill in the Gulf of
22 Mexico were working at a temporary site about a

1 quarter of a mile to the south of Millard. Over
2 800 contractors were present working outdoors or
3 in large tents on the other side of the canal.

4 This next photo depicts the cloud from
5 the ammonia release as it traveled across the
6 canal where Deep Water Horizon workers were
7 staged. The workers were engulfed in the toxic
8 cloud and immediately reported experiencing
9 symptoms of ammonia exposure. The contractors
10 were instructed to go into their cars and
11 evacuate the facility.

12 Of those 800 off-site contract
13 workers, as well as crew members on the ships
14 that were docked at Millard, 152 reported ammonia
15 exposure symptoms. Thirty-two of those one
16 hundred and fifty-two were hospitalized and four
17 were placed in intensive care.

18 The Mobile Fire Department and
19 emergency medical services that responded to the
20 incident set up a triage near the Deep Water
21 Horizon cleanup site where many were evaluated,
22 treated and released and evacuated from the area.

1 Some were transported to the hospital.

2 In response to the number of off-site
3 exposures, the Center for Disease Control's
4 Agency for Toxic Substances and Diseases
5 Registry, or ATSDR, conducted an exposure survey
6 in Theodore following the incident. According to
7 the CDC And ATSDR, common symptoms reported were
8 headache, shortness of breath and coughing.

9 Other symptoms included eye irritation, nausea,
10 chest pain and dizziness. The CSB followed up
11 with the Mobile County Health Department
12 following the release and confirmed that there
13 were no documented long-term effects of ammonia
14 exposure from those who experienced symptoms
15 following the incident.

16 One Millard employee working in the
17 crane was overcome with ammonia from the rooftop
18 release while he was loading the ships docked at
19 Millard. He attempted to escape, reports briefly
20 losing consciousness and falling several feet
21 injuring his leg. In addition to his leg injury
22 he reported symptoms consistent with ammonia

1 exposure. Another Millard employee who responded
2 to the ammonia release by closing valves on the
3 roof was treated for heat exhaustion and released
4 from the hospital. In addition to the injuries,
5 the Mobile County Emergency Management Agency
6 ordered a shelter-in-place for the nearby
7 community for several hours following the
8 release.

9 Eight million pounds of product stored
10 at Millard were contaminated and destroyed as a
11 result of the release inside the warehouse blast
12 freezer.

13 The Coast Guard also temporarily
14 halted water traffic in the industrial canal
15 until the release was contained.

16 The ammonia release was caused by a
17 hydraulic shock event when the defrost cycle was
18 interrupted on a group of evaporators. This
19 resulted in a rupture of two pieces of ammonia-
20 containing equipment associated with those
21 evaporators. Here are two photos showing the
22 cracked weld in an evaporator piping manifold

1 that was located inside the blast freezer.

2 This slide shows photos of the cracked
3 suction header on the roof. This 12-inch-
4 diameter pipe is associated with the evaporator
5 equipment and the blast freezer. The force of
6 the impact generated by the propelled liquid
7 ammonia in the hydraulic shock event cracked the
8 end of the suction line. The crack went through
9 the circumferential weld on the end of the pipe.

10 On the bottom left is a photo of the
11 fracture surface in this three-eighths-inch-thick
12 suction line. Right there. This photo reveals
13 that the metal failed under brittle conditions as
14 the pipe was operating at minus 40 degrees.

15 Again, here is a schematic of the
16 defrost cycle except this time we're showing what
17 likely happened on the day of the incident.

18 During the hot gas cycle the liquid feed valve
19 and suction valves were opened prematurely.

20 Right there and here. This resulted in the cold
21 and hot ammonia to be present in the coil and
22 into the suction header on the downstream side of

1 the suction stop valve. The rapid condensation
2 propelled the liquid through the coil and into
3 the suction piping. The approximate locations of
4 the failures of the evaporator coil are
5 identified here and here.

6 This slide shows the progression of a
7 hydraulic shock event inside the pipe. Here is a
8 cross-section of an evaporator coil containing
9 hot gas at 110 degrees Fahrenheit. When the
10 defrost cycle was interrupted, the hot gas and
11 minus 40-degree liquid ammonia became present in
12 the same pipe. The hot gas rapidly condensed to
13 a liquid upon contact with the cold minus 40-
14 degree refrigerant. Voids of trapped gas built
15 up pressure and rapidly condensed creating a
16 vacuum.

17 The reduction in volume produced an
18 inrush of liquid from other parts of the system.
19 The liquid accelerated at a high velocity when it
20 arrived at an obstruction such as the end cap on
21 the roof and it abruptly stopped and exerted a
22 force on the piping. The force of the impact was

1 strong enough to crack the weld on the evaporator
2 piping in the blast freezer as well as the 12-
3 inch piping on the roof ultimately resulting in
4 the release of 32,000 pounds of ammonia.

5 The CSB found in their investigation
6 of the 2010 Millard ammonia release incident that
7 both design and operational issues led to the
8 hydraulic shock failure at the Theodore facility.
9 The investigation team developed lessons learned
10 in the CSB safety bulletin released today to
11 prevent similar hydraulic shock incidents from
12 occurring in the industrial refrigeration
13 industry.

14 CSB safety bulletins are products that
15 focus on the immediate and technical failures of
16 an incident and focus key lessons on the
17 prevention of future incidents. The intended
18 audience for these key lessons is the ammonia
19 industry, including refrigerated warehouses, food
20 production and storage facilities, as well as
21 institutions that provide training and education
22 to ammonia refrigeration system designers and

1 operators with the aim of preventing hydraulic
2 incidents from occurring in ammonia-containing
3 equipment.

4 The CSB will be releasing a safety
5 video about the Millard incident and hydraulic
6 shock. The video will be available on our Web
7 site, www.csb.gov, later this month.

8 And now Attorney/Investigator Beeta
9 Lashkari will come to the podium to present the
10 CSB's lessons learned from the Millard
11 investigation. Thank you.

12 INVESTIGATOR LASHKARI: Thank you, Ms.
13 Tyler.

14 Lessons learned. Refrigeration system
15 design. 1) For the design of ammonia
16 refrigeration systems avoid grouping multiple
17 evaporators to a single set of control valves.
18 This is especially important for large-capacity
19 evaporators in excess of 20 tons. Evaporators
20 with hot gas defrost systems should be controlled
21 by individual valve control groups dedicated to
22 each evaporator coil.

Refrigeration system operation. 2)

Program or configure defrost control systems with interlocks to ensure the low-temperature liquid feed and hot gas remain isolated during the initiation and termination of the hot gas defrost cycle in the event of a power outage, cycle interruption or other abnormal situation.

Program the defrost control sequence to automatically depressurize or bleed the coils and defrost upon restart after an outage or interruption prior to opening the suction stop valve to set the evaporator into cooling mode.

3) Avoid the manual interruption of evaporators in defrost and ensure systems are equipped with password protection to ensure only trained and authorized personnel have the authority to manually override system processes.

4) For time-initiated hot gas defrost systems ensure pump-out times are long enough to remove a sufficient amount of residual liquid refrigerant in the evaporator coils prior to introducing hot gas especially after low load

1 periods or power outage.

2 Responding to an ammonia release. 5)

3 In the event of an ammonia release that cannot be
4 promptly isolated activate the emergency shutdown
5 switch to de-energize pumps, compressors and
6 valves instead of attempting to isolate leaking
7 equipment while the refrigeration system is
8 running. Shutting down the equipment will stop
9 the circulation of ammonia and limit the release
10 of additional ammonia from components running
11 upstream of failed equipment or piping.

12 I now invite questions from the Board.

13 CHAIRPERSON MOURE-ERASO: Thank you
14 very much. I now will invite my fellow Board
15 members to ask questions to the investigation
16 team concerning this Millard investigation. Mr.
17 Ehrlich?

18 MEMBER EHRLICH: Yes, I have several
19 questions and they're all focused kind of around
20 the emergency response arena here. Was there any
21 indication at all that pre-emergency planning had
22 been done with the local first responders as part

1 of a HAZWOPER plan or an emergency planning
2 session?

3 INVESTIGATOR BANKS: We don't have any
4 documentation of such, but it affords the
5 opportunity to address that and speak to the need
6 to have an adequate pre-incident planning scheme
7 so that the responding fire departments and
8 emergency responders are on the same page. We've
9 encountered several instances in other incidents
10 where responders may be operating under the
11 National Incident Management System, or NIMS,
12 process and communications may not be clear and
13 such. We have some indication that there was
14 some issues with the volunteer fire department
15 response in concert with the Mobile Fire
16 Department, but I would imagine that those issues
17 have been resolved since then.

18 MEMBER EHRLICH: Did they have and
19 emergency response plan filed under the 1910.120
20 or an evacuation plan filed under 1910.38 OSHA
21 standard, do you know?

22 INVESTIGATOR BANKS: No, we don't.

1 MEMBER EHRLICH: Okay. You mentioned
2 the fact that there were audible or visual alarms
3 inside of the building to indicate an ammonia
4 release. Were any of those alarms set up so that
5 there was visual or audible indications outside
6 of the building?

7 INVESTIGATOR TYLER: No, there
8 weren't. That was one of the things that we
9 looked for early in the investigation, but we
10 learned that all of the ammonia sensors and
11 alarms were located inside the facility. So
12 there was no indication for workers outside if
13 there was an ammonia release unless they heard it
14 coming from the inside of the facility.

15 MEMBER EHRLICH: Had any training been
16 given to the employees of the ship crew or the
17 ship members relative to the potential hazards?

18 INVESTIGATOR TYLER: I'm unaware of
19 the training that they had related to ammonia
20 hazards, but I do know shortly after the release
21 occurred that one of the ship crew members was
22 very concerned about a possible deflagration or

1 an ignition from the ammonia vapors that were
2 escaping from the roof. So he worked with the
3 Mobile Fire Department to get the engines on the
4 ship shut down.

5 MEMBER EHRLICH: And did the people
6 inside of the plant -- do you know if they had
7 any training under respiratory standards or any
8 other general HAZWOPER standard?

9 INVESTIGATOR TYLER: We know that at
10 least one employee that responded to the ammonia
11 release was HAZWOPER trained, but we also learned
12 in our investigation that there were other
13 employees that responded to the release that had
14 not had their training under HAZWOPER and they
15 were -- they received a citation from OSHA for
16 that.

17 MEMBER EHRLICH: Yes. Just as a point
18 of information, there is a company here in New
19 Jersey who put in an ammonia refrigeration system
20 for frozen food manufacturing and they evaluated
21 a number of inherently safer technologies when
22 they put this system in, and they got the okay

1 from the state DEP to go ahead and use ammonia.
2 And they have a fail-safe system where if there's
3 any problem at all in the system, all of the
4 ammonia drains back to basically a gas-tight
5 room. And the off-site consequences of an
6 ammonia release were reported at zero parts per
7 million.

8 If you want information on that, you
9 can contact the New Jersey DEP, John Notta, and
10 he'll be able to assist you with that
11 information. Thank you.

12 CHAIRPERSON MOURE-ERASO: Any other
13 questions? Mr. Griffon?

14 MEMBER GRIFFON: Yes, just a couple,
15 two questions, but each of them have four or five
16 parts.

17 First, can you tell me a little more
18 about the points of failure with the system,
19 specifically did the piping and components meet
20 required design specifications? Were they used
21 beyond their design life? Were they properly
22 maintained and inspected?

1 INVESTIGATOR TYLER: Yes, sure, I can
2 answer that. The team conducted a visual
3 examination of the pipe that failed on the roof
4 of the Millard facility. We reviewed the
5 manufacturing records as well as the pressure
6 test records from the piping supplier. We
7 learned that the pipe was ASTM A106 grade B pipe,
8 which is one of the pipes that is recommended for
9 this type of service. The pipe was about four or
10 five years old at the time of the incident and
11 did not possess any visual signs of corrosion,
12 stress corrosion, cracking or any type of
13 metallurgical defect.

14 MEMBER GRIFFON: And maintenance and
15 inspection records, did you have a sense that
16 they were meeting the inspection timing, or were
17 there required inspection intervals and were they
18 doing those inspections?

19 INVESTIGATOR TYLER: Millard did have
20 a preventive maintenance program, but I don't
21 recall the frequency of their visual inspections
22 on that pipe.

1 MEMBER GRIFFON: Okay. Second
2 question is how was the decision made? You speak
3 about this decision to stop the leak rather than
4 initiating an emergency shutdown, and I'm curious
5 how the decision was made, and was loss of
6 product a factor in making this decision? I know
7 they were just coming back from a power outage
8 for several hours, I believe, and food was
9 probably thawing out. And also was there a
10 procedure in place for this and were they
11 following their procedure?

12 INVESTIGATOR TYLER: So to answer the
13 first portion of your question, I think that
14 product loss was definitely a concern for Millard
15 employees and management on that day. Having a
16 seven-hour power outage in Alabama in August, I
17 think that they were concerned about their
18 product starting to thaw. So when they had this
19 second release, I think that there was an attempt
20 to try to isolate it at the source instead of
21 shutting down the entire system.

22 Their emergency plan for responding to

1 an ammonia release does state to attempt to
2 locate and isolate the release, but with the
3 particular system that was the location of the
4 release on that day it was almost impossible for
5 them to isolate the release on the roof because
6 other pieces of ammonia-containing equipment
7 continued to feed into that pipe. So in that
8 particular incident shutting down the entire
9 system would have decreased the duration and
10 quantity of that release.

11 MEMBER GRIFFON: And how did they
12 ultimately, or who ultimately made the call for
13 going to an emergency protocol, an emergency
14 shutdown protocol?

15 INVESTIGATOR TYLER: I'm not quite
16 sure who that was. I know that the plant manager
17 as well as the refrigeration operator or plant
18 engineer were involved in that decision. And I'd
19 also just want to add that one of the things that
20 Millard had identified in their investigation
21 report that the emergency stop button should have
22 been activated to -- would have been the proper

1 response to that particular release.

2 MEMBER GRIFFON: Thank you.

3 CHAIRPERSON MOURE-ERASO: Thank you.

4 I have a couple of questions, too. But before I
5 would like to recognize that among the audience
6 here joining us is Mr. Rick Engler. He is in the
7 audience. He was recently confirmed by the
8 Senate for the position of a Board member and he
9 will be taking his place on the CSB Board in
10 February. I truly look forward to working with
11 you in the future, Rick.

12 I have a couple of questions. Mr.
13 Ehrlich mentioned that, like in every other
14 state, there is an active food refrigeration
15 industry in New Jersey. And I wonder if any of
16 you can discuss the prevalence of ammonia
17 incidents in the food industry, or of any other
18 industries, and if you can give us an idea of how
19 widespread is the problems with escapes of
20 ammonia and problems with ammonia in the nation.

21 INVESTIGATOR LASHKARI: I'd be happy
22 to answer that question for you. The CSB tracks

1 ammonia incidents of high consequence, high
2 consequence being those that report a result in
3 injury or a fatality, evacuation or shelter-in-
4 place of 500 residents or acute environmental
5 impact or economic impact of over \$500,000 and
6 found that the total number of high consequence
7 incidents in all industries is 276 from the time
8 span of 2005 to 2014. And that accounts for 11
9 percent of all CSB-screened incidents.

10 In terms of industry type 15 reported
11 from refrigerated warehousing, 111 from food
12 manufacturing and 19 from food distribution.
13 Fifty-two percent of ammonia release incidents in
14 CSB incident screening data are from industries
15 like Millard that store, manufacture and
16 distribute refrigerated foods.

17 CHAIRPERSON MOURE-ERASO: Thank you
18 very much. I have another question. The CSB has
19 various options in conducting these
20 investigations. Some of the options include full
21 investigations that include recommendations to
22 different stakeholders, specifically regulatory

1 agencies in the federal and state level. In this
2 case the choice was made to conduct an
3 investigation to produce a safety bulletin that
4 is designed not to make specific recommendations
5 to either OSHA or EPA, but rather it takes
6 lessons learned to the refrigeration food
7 industry. It takes what you call a lessons
8 learned approach. Why was this option taken?

9 INVESTIGATOR BANKS: Well, the entity
10 that was Millard Refrigerated Services doesn't
11 exist anymore. They don't do cold storage. They
12 ship and store and move other commodities, but
13 they don't do cold storage. There would be no
14 recipient for recommendations which are a typical
15 offshoot of our investigative reports and case
16 studies.

17 We felt that the circumstances for
18 this case lent themselves to a fairly
19 comprehensive study of the hydraulic shock
20 phenomenon and that there were lessons learned
21 that were applicable to a wide array of food
22 processing and refrigeration services that

1 typically us ammonia in their processes. So both
2 factors were the main drivers for the decision to
3 create a bulletin and the lessons learned that we
4 have crafted for this product we feel there's a
5 significant audience out there that can draw and
6 learn from this to prevent recurrence.

7 CHAIRPERSON MOURE-ERASO: Thank you
8 very much. Also, it is my understanding that the
9 use of ammonia and the ammonia industry is highly
10 regulated. There are a number of regulations
11 that specifically address ammonia, and also of
12 course they are included on the PSM standard of
13 OSHA and the RMP standard of EPA. So will you
14 consider it's a high-regulated type of industry,
15 or there is a lot of law reading around how to
16 handle ammonia correctly?

17 INVESTIGATOR TYLER: Yes, through our
18 investigation we looked at PSM and RMP. The
19 Millard facility was covered under process safety
20 management as well as the risk management plan.
21 It's a highly-regulated chemical. And, yes,
22 there's a lot of literature available on the

1 hazards of ammonia, but what we thought would be
2 most useful for the ammonia refrigeration
3 industry; that includes anyone that handles in
4 ammonia in cold storage or any other type of
5 industrial operation, is the mechanism of
6 hydraulic shock. And that was why we focused
7 this bulletin on key lessons for the prevention
8 of that phenomenon.

9 CHAIRPERSON MOURE-ERASO: Thank you.

10 Yes, I remember they handling of anhydrous
11 ammonia and the production of anhydrous ammonia
12 is one of the kind of building blocks in the
13 teaching of chemical engineering. I mean, every
14 chemical engineer that is here will know that in
15 Chemical Engineering 101 is where you study the
16 ammonia industry and how it functions. And so,
17 not a lot about safety, but the ammonia industry
18 is very well known. It's a very old industry. I
19 think it's considered like the type of industry
20 that defined chemical engineering. So it's a
21 whole system of -- so thank you very much.

22 For anybody that follows the program

1 here, we just have finished the Board questions
2 to the investigators and we are moving into the
3 public comment. I would like for the public
4 comment to ask the managing director of the
5 Chemical Safety Board, Dr. Daniel Horowitz, to
6 preside the public comments.

7 So, Daniel, please?

8 DR. HOROWITZ: Thank you, Mr.
9 Chairman.

10 The first commenter is Mr. Orville
11 Morales (phonetic) representing Congressman
12 Pascrell.

13 MR. MORALES: Good evening, ladies and
14 gentlemen. Good evening, members of the Board.
15 I am Orville Morales representing Congressman
16 Bill Pascrell of the 9th Congressional District.
17 Unfortunately he couldn't be here tonight, but he
18 wanted to make sure that his thoughts were heard
19 on this particular matter.

20 So on behalf of Congressman Pascrell,
21 thank you to the Chemical Safety Board for coming
22 to Bergen County and holding this public hearing

1 tonight and for your report on the explosion that
2 occurred at US Ink in 2012. Our hearts go out to
3 the employees who were injured and their
4 families.

5 The events two years ago shed
6 important light on the need for safety standards
7 for combustible dust. These standards are long
8 overdue. We know that the CSB has been pushing
9 for these standards for almost a decade. The
10 reality is without these standards our workers
11 are simply not safe. We want the public and the
12 Board to please be assured that Congressman
13 Pascrell will work to push OSHA to establish
14 meaningful standards for combustible dust which
15 will go a long way in preventing a tragedy like
16 this from happening again. Thank you.

17 CHAIRPERSON MOURE-ERASO: Thank you
18 very much, Mr. Morales.

19 DR. HOROWITZ: Thank you. Next up is
20 John Morawetz. And, John, if you don't mind to
21 spell your name for the court reporter. Thank
22 you.

1 MR. MORAWETZ: Sure. It's Morawetz,
2 M-O-R-A-W-E-T-Z. Thank you again for doing the
3 investigative work that the CSB, the Board and
4 the staff do. When I talk about to people I work
5 with and the members of about nine different
6 unions that we train, we always point to the CSB
7 reports as excellent reports for two primary
8 reasons: One, the root cause analysis to what
9 happen where many other agencies have other
10 missions and other investigations they do and are
11 limited by. And I think it's a real strength of
12 the Board and the reports and the staff that they
13 really get into how everything happened.

14 Number two is the recommendations,
15 which in general I understand is the safety
16 bulletin. But in general the recommendations are
17 often far-reaching, as the staff have said, not
18 just for one company, which right now at this
19 facility they don't do refrigeration, but Millard
20 is a very large company that has I think over 30
21 refrigeration warehouses. So those lessons can
22 be spread.

1 I am here also in particular -- I'm
2 part of the Chemical Worker Council of the United
3 Food and Commercial Workers Union. And I was
4 requested by the health and safety staff of the
5 UFCW to come to the meeting because we have a
6 great interest in ammonia. It's used in many of
7 our facilities as documented by some
8 investigators: meat, poultry processing
9 facilities and refrigerated warehouses. And I
10 hope that there will be further work by the
11 Chemical Safety Board on ammonia. It's a very
12 large volume chemical. There are a lot of
13 releases as documented and they need further
14 investigation with full recommendations.

15 I would hope also that, as I've said
16 before, there could be adequate time to look at
17 the reports. I got this electronically this
18 afternoon as it was released in a press release
19 in a link, but I think for helpful back and forth
20 comments from the public and various
21 professionals and organizations I would hope
22 there was a method, which I leave to the CSB to

1 decide how to do that, where there could be time
2 for back and forth.

3 Limited in time, I would concentrate
4 on a few issues that I think that are touched
5 upon in terms of the lessons learned, which slide
6 No. 3 talked about operational issues. Operation
7 issues that I don't think were included are are
8 there adequate staffing levels? Were people
9 adequately trained? I think some of the Board
10 members mentioned that. There are a number of
11 applicable OSHA standards. It's not just
12 narrowly what happened, how was the response?
13 There are many factors go on.

14 Three years ago UFCW and Cargill did
15 a meeting of 10 different facilities about
16 ammonia and they identified that as a significant
17 problem of lean staffing, of non-trained workers
18 jointly by management activities. And quite
19 frankly, it's disappointing that that wasn't
20 looked at, wasn't examined. I understand again
21 it's a safety bulletin, but I think it's an
22 important factor.

1 Was there inspection of the piping
2 integrity? In this case that didn't happen, but
3 at least that should be looked at and reported
4 on.

5 And then in terms of the OSHA
6 standards, I understand this is not a place for
7 full regulatory analysis, but I find it strange
8 that there's very little mention of OSHA where
9 correctly the CSB repeatedly has asked, as they
10 will of the next, I believe, investigation, for a
11 combustible dust standard, that we don't also
12 look at when standards exist how were they
13 implemented? And this is clearly covered by
14 process safety management. I find it troubling
15 there's no mention of process safety management
16 or emergency response. No mention of HAZWOPER.
17 Again, not a regulatory analysis, but there could
18 at least be a list of what are the applicable
19 standards that would have applied?

20 And lastly, I'd just say again to
21 repeat, this is a safety bulletin. I would hope
22 that there could be a meeting convened or an

1 investigation; I'm not sure of the mechanism, by
2 the CSB with labor and management to sit down and
3 talk about the uses of ammonia and to find out
4 how we can handle it better. Thank you very
5 much.

6 DR. HOROWITZ: Thank you. Mark
7 McDonald (phonetic)?

8 MR. McDONALD: Good evening. United
9 Steel Workers District 4 and the United Steel
10 Workers Health Safety and Environmental
11 Department would first like to thank the Chemical
12 Safety Board for their extensive and thorough
13 investigation striving to find the root causes
14 for these horrific accidents. We would also like
15 to thank the CSB for their dedication to
16 protecting workers and surrounding communities
17 from the hazards during these investigations and
18 their diligence in recommending and campaigning
19 for safer policies, procedures and laws to
20 prevent these tragedies from happening again.

21 Our long-time history of working with
22 the CSB has developed recommendations and later

1 laws that have prevented further tragedies from
2 occurring. Our work is not done. We still have
3 to push to keep laws and policies intact in order
4 to keep our workers and communities safe.

5 New Jersey is not like the rest of the
6 country. Our land use and risk factors justify
7 more stringent state regulations. More stringent
8 state regulations is authorized by most if not
9 virtually all federal environmental laws, and New
10 Jersey has led the country in that regard.

11 New Jersey's Toxic Catastrophic
12 Prevention Act, TCPA Program, was the model for
13 the federal program established under Section
14 112(r) of the Clean Air Act. Industries would
15 obviously prefer backing off of the EP -- and
16 using EPA thresholds. However, the increases
17 made by the EPA on adoptions were so large,
18 averaging some 18 times the CPA values, with 33
19 of the 60 substances common to both lists
20 assigned from 5 to 167 times corresponding TCPA
21 values, but they are not technically justified in
22 an area as densely populated as New Jersey where

1 substances are generally handled on a small site
2 and would correlate with a significant increase
3 in the number of potential fatalities.

4 In New Jersey TCPA threshold quantity
5 for anhydrous ammonia is 5,200 pounds. This
6 lower threshold is justified by risk as a
7 function of the New Jersey population density and
8 proximity to chemical use. In contrast, the
9 federal thresholds quantity is almost twice New
10 Jersey's at 10,000 pounds. That means more
11 facilities are regulated under the New Jersey
12 program and that more people are protected from
13 catastrophic release of a highly toxic chemical.

14 In addition to a lower threshold of
15 the regulations the TCPA Program provides
16 additional regulatory and oversight safeguards
17 and far more compliance monitoring and
18 enforcement resources per facility than the
19 federal programs which include but are not
20 limited to mandatory inspections versus
21 discriminatory three-year federal inspections.

22 Risk considerations. The industry

1 testimony failed to mention the most critical
2 issues, the risk of workers and nearby
3 communities that could be exposed to the
4 catastrophic release of an accident. TCPA and
5 federal regulations require a facility to model
6 the risks of such an event. To understand the
7 natural and magnitude of these risks legislators
8 need to ask the industries to present their
9 consequence analysis on New Jersey's TCPA
10 regulations.

11 Status of TCPA regulations. Contrary
12 to the industry testimony that suggested that the
13 New Jersey TCPA regulations were outdated and not
14 informed for by more recent improvements of the
15 federal programs, please be advised that the
16 current New Jersey DEP TCPA regulations were
17 readopted with amendments on March 16th of 2009.
18 The TCPA rules were scheduled to expire in 2014,
19 but were extended two years as a result of recent
20 legislation that extended the sunset date for
21 rules from five to seven years.

22 The TCPA is now under attack by two

1 bills, S-2511 and A-3881, that would weaken New
2 Jersey's Toxic Catastrophic Prevention Act. The
3 bill removes anhydrous ammonia used by
4 refrigeration as substances regulated by TCPA.
5 It is our understanding that anhydrous ammonia
6 refrigerant issues were specifically considered
7 by DEP in the 2009 readoption process and that
8 the DEP expressly reviewed and rejected the
9 industry's request to weaken New Jersey's
10 requirements.

11 According to the DEP TCPA regulations
12 the basis for regulating anhydrous ammonia is
13 twofold: Mandated by -- listed by Congress
14 ammonia is an extraordinarily hazardous
15 substance, and EHS lists vapors pressure 10
16 millimeters of mercury pressure according to the
17 Federal Agency of Toxic Substances and Disease
18 Registry. Risks from anhydrous ammonia include
19 death from inhalation, as we all know.

20 We ask for the CSB's continued support
21 on this fight to keep New Jersey's Toxic
22 Catastrophic Prevention Act in place and their

1 future support to protect workers and the
2 surrounding community. Thank you.

3 DR. HOROWITZ: Thank you, Mr.
4 McDonald.

5 CHAIRPERSON MOURE-ERASO: Thank you
6 very much.

7 DR. HOROWITZ: Next up is John Shin
8 (phonetic). Mr. Shin?

9 MR. SHIN: Good evening. I'm John
10 Shin. I'm the district director for the United
11 Steel Workers in District 4. District 4 consists
12 of nine states in the Northeastern United States,
13 including the six New England states, New York,
14 New Jersey, Delaware and also Puerto Rico. Also
15 I sit on the board of the Work Environment
16 Council in New Jersey.

17 I have one concern and a couple
18 questions I'd like to ask. First one, my concern
19 is the Steel Workers Union is very disappointed
20 in the Chemical Safety Board's short notice of
21 this public meeting. We would ask that longer
22 notice be given in the future to give all the

1 stakeholders an opportunity to participate in
2 these meetings.

3 Secondly, I have a question for the
4 Chairman. The question would be: Why has the
5 Chemical Safety Board lost its ability to provide
6 Web casts of Chemical Safety Board public
7 meetings? A lot of USW locals used to
8 participate in the Web casts and we would be ask
9 that they be re-instituted.

10 No. 3, third question: The Board
11 announced this week in its next public meeting --
12 the next public meeting for later in January at
13 the Chevron, Richmond, California case. This is
14 a USW-represented facility. We're disappointed
15 that the Chemical Safety Board decided to have
16 this meeting just a couple weeks before the
17 fourth Board member would be sworn in and would
18 be able to participate in the meeting. We would
19 ask the Board to reconsider holding this meeting
20 after the fourth Board member is sworn in so they
21 can also participate in this meeting. Thank you
22 for your time.

1 DR. HOROWITZ: Thank you, Mr. Shin.
2 And to clarify one point that you did raise, we
3 do Web cast our meetings on occasion, and if
4 there's interest, we'll certainly look at
5 expanding that program. Thank you for your
6 comment.

7 Next up is Peter Levitt (phonetic).
8 Mr Levitt?

9 MR. LEVITT: Sorry, I wrote my name
10 down, but --

11 (Simultaneous speaking)

12 DR. HOROWITZ: Okay. It does happen.
13 Is there anybody who didn't sign up who'd like to
14 comment on this case?

15 (No audible response)

16 CHAIRPERSON MOURE-ERASO: Thank you
17 very much, Dr. Horowitz. So we move to the Board
18 vote on the safety bulletin. I pass the gavel.
19 I pass the meeting to my general counsel to
20 conduct the vote. I will start by -- as a Board
21 member I make the following motion: I move that
22 the Chemical Safety Board approve Safety Bulletin

1 No. 2010-13-A-AL entitled, "Key Lessons for
2 Preventing Hydraulic Shock in Industrial
3 Refrigeration Systems: Anhydrous Ammonia Release
4 at the Millard Refrigeration Services,
5 Incorporated," based on an incident occurring in
6 Theodore, Alabama in August 23rd, 2010. Is there
7 any discussion on the motion?

8 PARTICIPANT: I second the motion,
9 first of all.

10 CHAIRPERSON MOURE-ERASO: Okay.

11 PARTICIPANT: I'll second the motion
12 and then I guess we can move to discussion.

13 CHAIRPERSON MOURE-ERASO: Yes.

14 PARTICIPANT: I just have one comment.
15 I do second the motion and I support the motion.
16 I do want to point out again; and I think Beeta
17 went through the numbers for us, which is very
18 good, there's been a lot of ammonia incidents and
19 I think in the future I would hope that the Board
20 will look at a study or a forum to discuss the
21 broader national problems of ammonia and look at
22 some of the other potential recommendations in

1 that area. That's the only comment I have.

2 CHAIRPERSON MOURE-ERASO: Anything
3 more for discussion of the Board members?

4 (No audible response)

5 CHAIRPERSON MOURE-ERASO: Okay.
6 Hearing no more discussion, I will call the
7 question. General counsel Mr. Loeb will record
8 the vote.

9 MR. LOEB: The motion is on the
10 question whether we adopt the report, and why
11 don't we just take it left to right? Mr.
12 Griffon?

13 MEMBER GRIFFON: I support and vote
14 yes.

15 MR. LOEB: Mr. Ehrlich?

16 MEMBER EHRLICH: I vote yes.

17 MR. LOEB: Mr. Chairman?

18 CHAIRPERSON MOURE-ERASO: I vote yes.

19 MR. LOEB: The motion is adopted.

20 CHAIRPERSON MOURE-ERASO: Thank you
21 very much. As a closing remark before we take a
22 break, I would like to say that we choose this

1 very specific approach of use lessons learned
2 aimed to alert the food refrigeration industry of
3 events that could trigger hydraulic shock, and
4 this is a event of a magnitude enough to cause
5 enormous escapes of anhydrous ammonia that as you
6 well know could be lethal for workers and for
7 communities.

8 This knowledge about hydraulic shock
9 is not widespread in the industrial refrigeration
10 industry and facilities and requires explicit
11 analysis and examination or how to be prevented.
12 I think that's what the safety bulletin does.

13 The message to the food and
14 refrigeration industry in New Jersey, in Alabama
15 and in all other states in the United States is
16 that hydraulic shock should be prevented and we
17 believe that our safety bulletin is a
18 contribution to that effect.

19 I think we finish the first part of
20 our meeting and I would like for a 15-minutes
21 break. After that we will reconvene to have the
22 second part of our meeting on US Ink case study.

1 So I declare a recess of 15 minutes.

2 (Whereupon, the above entitled matter
3 went off the record briefly.)

4 CHAIRPERSON MOURE-ERASO: Okay. We
5 reconvene the CSB public meeting.

6 First of all, before proceeding to the
7 US Ink case I would like to recognize Mr. Creese
8 Jagged (phonetic), Mr. Stanley Pernesky
9 (phonetic) and Mr. John Castle (phonetic). They
10 are all three workers for US Ink that are with us
11 here at this meeting.

12 So welcome. Thank you for being here
13 with us.

14 And we move to the next point of the
15 agenda. That is the US Ink presentation. I
16 would like to call again to Mr. Banks to begin
17 the presentation. And I will appreciate it if
18 Mr. Banks will introduce the members of his team.

19 So, Mr. Banks?

20 INVESTIGATOR BANKS: Good evening.
21 The next portion of the presentation tonight, the
22 US Ink investigation team is prepared to present

1 findings from our investigation of an ink dust
2 explosion and flash fires which occurred at the
3 US Ink manufacturing facility in East Rutherford,
4 New Jersey.

5 This incident occurred on Tuesday,
6 October 9th, 2012 and resulted in seven workers
7 suffering serious burn injuries when they
8 congregated at the entrance of the ink mixing
9 room after hearing a loud thump from the newly-
10 installed dust collection system on top of the
11 facility and seeing signs of an initial flash
12 fire from a bag dump station.

13 Before I start I'd like to take the
14 opportunity to provide an overview of the agenda
15 for this portion of our proceedings. Again,
16 proceeding with the team's presentation of
17 investigation findings. The team will entertain
18 questions from our Board. The public will be
19 invited to offer comments. The Board members
20 will vote on the team's proposed findings and
21 recommendations. And finally, we'll have a
22 closing statement from our Chair.

1 I'd like to take this opportunity to
2 introduce the team that investigated and
3 participated throughout this investigation, some
4 of whom are here, some that are not. There were
5 many contributors to the work on this
6 investigation and some that deployed on the
7 initial deployment immediately after the
8 incident. The core team consists of myself,
9 Johnnie Banks, the supervisory investigator; Mr.
10 Michael Corona, attorney/investigator; Ms.
11 Rachael Gunaratnam, investigator; Maria Musaki-
12 Bring (phonetic), investigator; Ms. Badisha
13 Parisrom (phonetic), investigator; Dr. Samuel
14 Oyewole, investigator; Ms. Reepa Shroff,
15 investigator; and Dr. Susan Casper-Onanberg
16 (phonetic), or deputy managing director for
17 recommendations.

18 The investigation team will conduct
19 the presentation, will discuss the company
20 background and provide an overview of the
21 facility and process and present the incident
22 description and the analysis of the incident,

1 investigation findings and introduce propose
2 recommendations.

3 Now, the US Ink company is a division
4 of Sun Chemical Corporation that's headquartered
5 in Carlstadt, New Jersey. The facility in East
6 Rutherford was established in 1993 and employed
7 34 workers, 24 of whom were on shift on the day
8 of the incident.

9 In looking at the black ink process,
10 we'll start with a brief description of the black
11 ink process. The US Ink East Rutherford plant
12 manufactures both black and color oil-based ink
13 for various commercial clients. A key step in
14 the ink production process is mixing solid and
15 liquid ingredients to produce liquid suspension.
16 The mixing operation for black ink ingredients is
17 performed in the pre-mix room where the October
18 9th, 2012 incident occurred.

19 The black ink manufacturing process at
20 US Ink involved the pneumatic transfer of bulk
21 solid powder under vacuum to one of three mixing
22 tanks labeled as T-106, T-206 and T-306. Two

1 solid ingredients; carbon black and kaolin clay
2 were conveyed to the mixing tanks by a vacuum
3 through piping from a manual raw material feeding
4 station known at US Ink as the bag dump station,
5 or by gravity from three overhead receiver
6 hoppers containing carbon black and kaolin.

7 Gilsonite, a resinous hydrocarbon, is
8 widely used as a primary carbon black wetting
9 agent for black news inks and heat set and
10 gravure inks. Gilsonite has a National Fire
11 Protection Association, or NFPA, flammability
12 rating of one and special precautions warn that
13 dusts are subject to explosion upon contact with
14 sparks, open flames or temperatures in excess of
15 1,000 Fahrenheit, or 570 degrees centigrade.

16 Petroleum distillate ingredients are
17 received at the facility by rail and are pumped
18 into the mixing tanks. Operators manage the
19 ingredient mixing from the control room adjacent
20 to the pre-mix room. Petroleum distillate used
21 in the process is flammable so they can be
22 considered as possible contributors to the

1 formation of explosive atmospheres on the day of
2 the incident.

3 Here's the simplified plan view of the
4 pre-mix room containing three large mixing tanks
5 in which the various ink formulations were made.
6 And if you look here, you'll see that the tanks
7 were denoted T-106, T-206, T-306 right there.
8 The room itself was about 30 feet by 17 feet
9 deep. There was a control room immediately
10 adjacent to the pre-mix room. The bag dump
11 station was located here in the middle of the
12 rolling service door and there was a man door
13 that was located here that provided access to a
14 stairway that accessed the mezzanine elevated
15 stairway for access to the tanks themselves.
16 There was a corridor that ran directly in front
17 of the pre-mix room and the exposed depression
18 control panel and dust collector control panel
19 were located across from this area. There was a
20 man door that allowed access into the pre-mix
21 room as well.

22 All three mixing tanks in the area are

1 5 feet in diameter and 10 feet high. An
2 automatic sprinkler system was installed as a
3 fire protection feature in the pre-mix room. The
4 sprinkler system was connected to an automatic
5 audible alarm. Once the sprinkler system is
6 activated, an automatic signal is relayed by an
7 external central monitoring station to the local
8 fire department for immediate response.

9 Now the bag dump station was
10 positioned, as I said, in the doorway of the pre-
11 mix room and an overhead roll-up service door was
12 installed for access in the pre-mix room. At the
13 time of the incident the CSB found that the roll-
14 up service door had been chained in a fixed
15 rolled up position to provide easier entry into
16 the room. Witness accounts from the plant
17 employees and contractors indicated that
18 Gilsonite dust generated from the bag dumping
19 operation often accumulated around the facility,
20 but particularly on flat surfaces. US Ink did
21 not provide effective means of containing
22 fugitive dust at the bag dumping station since

1 empty bags were often stacked alongside the bag
2 dump which in turn lofted the dust into the
3 atmosphere.

4 Before the October 2012 incident a wet
5 scrubber system was used to collect particulate
6 materials during the dry material charging stages
7 of the ink mixing process. The scrubbing system
8 deteriorated over the years. In addition the wet
9 scrubber system did not prevent the release of
10 fugitive dust into the pre-mix room when new ink
11 formulations used high-powder clay content
12 producing higher levels of particulate emissions.
13 The new dust collection system was installed to
14 improve the management of particulate material
15 and provide an overall improvement to the
16 operating conditions of the black ink production
17 process.

18 A US Ink lead engineer worked in
19 collaboration with the manufacture of the dust
20 collection system to design the new dust
21 collecting process. The engineer retired before
22 the dust collection system was installed and

1 commissioned. When he left the knowledge of and
2 the rationale for the dust collector went with
3 him.

4 Here we have a view of the dust
5 collection system, an overview. And as before,
6 we can see that the bag dump station was located
7 here. There was duct work that went to --
8 allowed access for the material into the pre-mix
9 tanks 106, 206 and 306. And there were various
10 sized ducts that made their way to the dust
11 collector, which was mounted on the roof.

12 The dust collection system illustrated
13 here consisted of a system of various sized ducts
14 including flexible connectors attached to the top
15 of each mixing tank and the bag dump station.
16 Dust particles were suctioned into the dust
17 collector, which was located in the roof of the
18 facility. The roof-mounted dust collector used a
19 cartridge system to remove the residual
20 particulate dust. Dust-laden air and vapor from
21 the mixing tanks entered the collector from the
22 cartridges and was drawn over the filters where

1 the dust was removed from the airstream.

2 A 25-horsepower fan was designed to
3 convey the dust up to the collector at a volume
4 rate of 3,300 cubic feet per minute. Compressed
5 air was used to periodically pulse the filter
6 cartridge and dislodge the filter dust into a
7 hopper of the dust collection system.

8 The collected dust was recycled back
9 to the ink making process via a 10-inch-diameter
10 pipe back to the top of T-106. A rotary air lock
11 on the hopper controlled the discharge of the
12 recycled fugitive dust via gravity from the
13 collector back into the mixing tank T-106 for
14 reprocessing in the pre-mix room.

15 Now, the dust collector was equipped
16 with an explosion suppression system. If a rapid
17 pressure increase was detected, sodium
18 bicarbonate would be released into the dust
19 collector. The explosion suppression system
20 would actuate and inject sodium bicarbonate via
21 an independent suppression container and chemical
22 isolation container located at two injection

1 points in the system, the dust collector hopper
2 and the inlet riser.

3 US Ink considered an explosion vent
4 panel system, but opted not to. The decision was
5 based on the reduced cost of installation and
6 external recommendations to avoid any potential
7 environmental release of combustible dust
8 particulates or fire into areas near residential
9 homes.

10 The explosion suppression system would
11 actuate and inject sodium bicarbonate via an
12 independent suppression container and chemical
13 isolation container located at the two injection
14 points that I mentioned earlier. In this
15 depiction here we can see the explosion
16 suppression container was located directly into
17 the hopper and the nozzle was directed into the
18 hopper and actuated when the incident occurred.
19 Here we have a view of the chemical isolation
20 dispersing right there on the inlet stream to the
21 dust collector.

22 US Ink/Sun Corporation provided the

1 information for the manufacture of the explosion
2 suppression and isolation system including
3 specification of the raw materials utilized in
4 the black ink pre-mix process, flash points of
5 oils and the normalized rate of pressurized or
6 Kst values for solid ingredients.

7 The new dust collection system for the
8 pre-mix room was commissioned for service on the
9 morning of Friday, October 5th, 2012, and then
10 operated until the end of the production shift at
11 3:00 p.m. At commissioning US Ink employees
12 would operate the system. Several black ink
13 production supervisors and one of the day shift
14 operators received a 15-minute operational
15 training and instruction as well as a walk-
16 through of the explosion suppression and
17 isolation system.

18 The dust collection was designed to
19 start automatically when any of the mixing tank
20 modules were engaged and to automatically shut
21 off after a specified delay when all mixers were
22 shut off. However, the dust collection system

1 continued to run overnight even when all the ink
2 mixers were shut off.

3 On Saturday, October 6th, 2012 the
4 plant maintenance employees used housekeeping
5 connections on the dust collection system to
6 vacuum dust and debris into the pre-mix room. At
7 the end of housekeeping activities the dust
8 collection system was manually shut down by a
9 maintenance employee. The mixing tanks and the
10 dust collection system were restarted on the
11 Monday night shift, October 8th, 2012, in
12 preparation for production runs scheduled for
13 Tuesday, October 9th, 2012.

14 On Tuesday morning, October 9th, 2012,
15 black ink production continued. The batch in T-
16 306 was completed and the pre-mix room operator
17 emptied the tank. At about 1:00 p.m. the pre-mix
18 room operator was loading Gilsonite into the bag
19 dump station when he heard a strange noise from
20 T-206. Because of the odd noise the operator
21 went to the control room to check the mixing tank
22 temperature and speed to confirm that the

1 equipment was working properly. As he left the
2 control room, he saw a flash fire originating
3 from the bag dump station where he had just been
4 working. The employee immediately proceeded in
5 the opposite direction to the pre-mix room to his
6 supervisor's office to alert him of the fire.

7 At about the same time other workers
8 heard a loud thump that shook the building. In
9 response to the flash from the bag dump station
10 and the subsequent loud thump, workers
11 congregated at the entrance of the pre-mix room.
12 Employees stated that the rubberized spiral-wound
13 duct tape duct hose material that connected T-306
14 to the dust collection riser appeared to be
15 melting and dripping onto the tank.

16 And here we have a view of the pre-mix
17 room again. And you'll note that the operator,
18 when he heard the noise, it was emanating from
19 this T-206. He went into this control room to
20 check his readings, and as he came out of this
21 door observed a flash from this bag dump station.
22 And at that point he proceeded to notify his

1 supervisor of the event.

2 Another employee who approached the
3 pre-mix area noticed the lights on the alarm
4 panel were red indicating that a pressure rise
5 had been detected and that the system had
6 activated. The employee alerted other workers in
7 the area that the explosion suppression had
8 activated and there was a fire.

9 In addition to the initial fireball
10 from T-306 witnesses observed a thick black cloud
11 venting into the corridor just ahead of the
12 fireball and reported an audible "whoosh." These
13 observations are consistent with the sights and
14 sounds of a combustible dust deflagration. A
15 deflagration is the propagation of a flame
16 through a fuel air mixture at a speed below the
17 speed of sound. It could be either a flash fire
18 or an explosion depending on the level and
19 consequences of the pressure generated during the
20 flame propagation.

21 Observation by CSB investigators of
22 the ceiling of the US Ink East Rutherford

1 facility shortly after the incident indicated
2 that the outward L-shaped path of the fireball
3 along the corridor near the pre-mix room.

4 The large flash fire and heated dust
5 mixtures that originated from above T-306 and
6 propagated into the corridor from the entrance of
7 the pre-mix room caused all employee burn
8 injuries. The injured employees had clothing
9 covered in black dust and they experienced burns
10 to exposed skin. Some burns resulted after the
11 clothing ignited from the fireball. The injuries
12 consisted mostly of burns to the upper torso,
13 arms, necks and heads. Other employees helped
14 the injured employees out of the plant and
15 emergency responders transported the injured to
16 hospitals. One of the injured employees was
17 wearing a short-sleeved T-shirt that day and
18 sustained third-degree burns on his left arm,
19 neck and upper torso. The employees were not
20 wearing flame-resistant clothing, or FRC.

21 I will now turn over the fire
22 department and emergency response section of this

1 presentation to Mr. Corona.

2 INVESTIGATOR CORONA: Thank you, Mr.
3 Banks.

4 The flash fire triggered the fire
5 sprinkler system in the pre-mix room which in
6 turn notified the local fire department. Fire
7 fighters and other first responders arrived at
8 the scene of the incident within three minutes of
9 the first alarm.

10 After they arrived and entered the
11 plant, members of the East Rutherford Fire
12 Department did not see any flames in the pre-mix
13 room because the sprinklers had extinguished any
14 fires outside of the enclosed equipment.
15 Although they observed no visible signs of flames
16 after the large flash event at Tank 306,
17 responding fire fighters reported that after
18 checking with their heat sensors several duct
19 work fires were detected. The fire fighters
20 separated the affected ducts and extinguished the
21 fires with water. The fire fighters also went up
22 to the dust collector on the roof and opened the

1 four covers but did not need to extinguish any
2 fires inside the dust collector itself.

3 Three distinct events occurred during
4 this incident: First, an employee observed a
5 flash originating from the bag dump station. The
6 bag dump station is located right down here on
7 this graphic. This attracted the attention of
8 several workers in the area. At about the same
9 time workers heard a loud thumping sound from
10 above, later concluded to be the activation of
11 the isolation and suppression canisters. The
12 isolation and suppression canisters are located
13 right here and right here.

14 This sound was accompanied by a pulse that
15 shook the entire building drawing more workers
16 from their respective work places to investigate.

17 After about two minutes seven workers
18 observed an approximately one-foot flame directly
19 over tank 306. The flame was observed in this
20 duct work right above tank 306. The flame then
21 gained additional energy from the powdery mixture
22 of accumulated carbon black, Gilsonite and clay

1 in the duct work. This mixture acted as fuel and
2 caused the flame to flash over the assembled
3 workers who were standing in the doorway of the
4 pre-mix room.

5 The CSB investigated three possible
6 points of origin of the fire: within the dust
7 collector, within the duct work above tank 306
8 and within tank 306 itself. From the evidence
9 obtained and examined the CSB concludes that the
10 fire originated within the duct work of the dust
11 collection system.

12 After an extensive investigation the
13 CSB concluded that the explosion and flash fires
14 occurred due to the self-heating and spontaneous
15 ignition of accumulated sludge-like material and
16 powdery dust mixture of Gilsonite, carbon black
17 and clay in the duct work above tank 306.

18 Several factors contributed to this ignition
19 including the uncontrolled heating of the mixing
20 tanks and the continuous operation of the dust
21 collection system for several hours after
22 commissioning.

1 Despite having temperature gauges and
2 recorders there were no temperature controls on
3 the mixing tanks. Additionally, the ink mixing
4 process design did not prescribe any safe
5 temperatures. The continuous operation of the
6 dust collection system for several hours after
7 commissioning continued to draw condensable
8 vapors into the duct. As a result, the dust
9 collector drew air into the duct, enhancing
10 combustion of the condensed vapors and
11 combustible dust.

12 With the dust collection system still
13 in operation the air within the system blew the
14 dust mixture towards the collector while the fire
15 burned. This caused ignition and a pressure rise
16 in the dust collector which was already filled
17 with a blend of Gilsonite, clay and carbon black.
18 Although the ignition led to a dust explosion
19 within the dust collector, the pressure rise
20 activated the explosion suppression system. The
21 pressurized discharge of the explosion
22 suppression canisters caused the thumping sound

1 employees heard below.

2 The sequence of events taking place in
3 the dust collection system is illustrated by the
4 following graph which was created using data
5 pulled directly from the dust collector post-
6 incident. It is important to note that the rapid
7 rise in pressure and suppression of the explosion
8 within the dust collector all took place in less
9 than one-half of one second.

10 Right here on the graph we can see a
11 slight increase in pressure before there's
12 ignition inside the dust collector. Right here
13 we can see a rapid increase in pressure which is
14 indicative of an explosion inside the dust
15 collector. Approximately 15 milliseconds after
16 the explosion it is detected and the isolation
17 and suppression canisters are activated. This
18 activation accounts for the thumping sound heard
19 by employees below. Approximately 30
20 milliseconds after the explosion is detected, it
21 is suppressed and we can see a decline in
22 pressure back down towards normal operating

1 levels.

2 The designed maximum pressure for the
3 dust collector was 3.8 pounds per square inch, or
4 psi, but on the day of the incident the maximum
5 pressure rose to 4.4 psi. As you can see from
6 the graph, the discharge of the suppression
7 isolation canisters created a pressure spike.
8 This caused the flame front to propagate counter-
9 current back down the duct work. The flame
10 traveled towards the mixing tanks and triggered
11 an initial flash fire at the bag dump station and
12 within the rubberized ducts above tank 306 where
13 the second more volatile flash fire occurred.

14 The CSB inspected the interior of
15 various duct work sections and took material
16 samples from six different sections of duct work.
17 These inspections revealed large accumulations of
18 both burned and unburned materials. Most of the
19 accumulations appeared to be black sludge-like
20 material. The CSB collected these samples for
21 further chemical composition analysis and testing
22 to develop possible ignition scenarios.

1 One of the tests conducted by the CSB
2 was to determine how explosible and severe the
3 dusts were that were involved in the incident.
4 The Kst value of a dust is the rate of pressure
5 rise and is essentially a measure of
6 explosibility. This value is measured in bar
7 meter per second.

8 US Ink provided data regarding
9 chemicals in the ink making process to the
10 manufacturers of the explosion suppression
11 isolation system. This data provided by US Ink
12 included a Kst value of 165 bar meter per second
13 for Gilsonite. As you can see from this chart
14 the Kst values for the two Gilsonite samples
15 collected by the CSB were higher than the 165 Kst
16 value the system was designed to handle. These
17 tests results indicate that Gilsonite is a faster
18 burning dust that is more prone to deflagration
19 and explosion and presented a greater challenge
20 to the explosion protection system than it was
21 originally designed for.

22 The next portion of our presentation

1 will examine issues related to the engineering
2 design analysis of the dust collection system and
3 my colleague Dr. Samuel Oyewole will lead this
4 section of the meeting.

5 INVESTIGATOR OYEWOLE: Thank you very
6 much, Mr. Mike Corona. The CSB performed an
7 engineering design analysis of this incident and
8 believes that excessive accumulation of
9 combustible material in the duct work was the
10 causal factor responsible for this incident. The
11 duct work accumulation was the foil for the
12 primary deflagration.

13 Also, improper design and operation of
14 the new dust collection system was the major
15 contributing factor that led to the October 9,
16 2012 incident. The dust collection system
17 operated at low conveying velocity and low F-flow
18 rate. While excessive amounts of dust and
19 condensable vapors were pulled into the duct
20 work, most of the accumulated dust settled
21 without getting conveyed up to the dust collector
22 on the roof top.

1 The CSB identified eight major design
2 issues which contributed to material accumulation
3 and low system performance.

4 Design Issue 1. Excessive amounts of
5 condensable vapors and dust was pulled into the
6 duct work. The air bleed, as you can see in
7 these photos, were attached to each tank head
8 space. This air bleed operated uncontrolled. As
9 a result, it continued to pull air which led to
10 conveying of excessive amounts of condensable
11 vapors and dust mixture from the mixing tanks to
12 the ducts during the operation of the dust
13 collection system.

14 Design Issue 2. The CSB found that
15 excessive amounts of dust was accumulated from
16 the housekeeping activity. The housekeeping
17 vacuuming activity that was done on Saturday,
18 October 6th, 2012 did not help matters. As you
19 can see in the middle image here, within a short
20 time cleaning ducts were plugged just after on
21 one housekeeping activity. The vacuuming
22 activity contributed additional dust to the duct

1 work, but did not have enough makeup air to
2 convey the picked-up dust to the dust collector
3 on the roof top for recycling.

4 Design Issue 3. The CSB found that
5 the dust collection system design was based on
6 low conveying velocity and F-flow rates. This
7 led to the accumulation of dust, oily sludge and
8 condensable vapor in the ducts. The American
9 Conference of Governmental Industrial Hygienist's
10 "Industrial Ventilation Manual of Recommended
11 Practices for Design" states that if solid
12 particulates or condensable vapors have been
13 transported through a system, a minimum velocity
14 is required.

15 The American Conference of
16 Governmental Industrial Hygienists, ACGIH, is a
17 professional association of industrial hygienists
18 one of whose objective is to advance worker
19 protection by providing scientific information
20 such as manuals, guides and recommendations on
21 occupational and environmental health issues.

22 The CSB found that the engineers

1 responsible for the design of the dust collection
2 system failed to ensure that the interior of the
3 duct work was clean and free of accumulated
4 material. The National Fire Protection
5 Association, NFPA, produces more than 300 codes
6 and standards intended to minimize the
7 possibility and effects of fire and other risks.

8 One of such standards is the NFPA 654
9 standard for the prevention of fire and dust
10 explosions from the manufacturing, processing and
11 handling of combustible particulate solids. The
12 2006 edition recommends that all duct work shall
13 be sized to provide the air volume and air
14 velocity necessary to keep the duct interior
15 clean and free of residual material.

16 The design conveying velocity of the
17 US Ink dust collection system was 1,150 feet per
18 minute, as you can see in the chart here.

19 However, the American Conference of Governmental
20 Industrial Hygienists, ACGIH, recommends the
21 minimum dust conveying velocity of 4,500 feet per
22 minute for average industrial dusts like the type

1 used at US Ink. The designed dust collection
2 system conveying velocity of 1,150 feet per
3 minute was approximately 25 percent inefficiency
4 when compared to the ACGIH recommended velocity
5 of 4,500 feet per minute.

6 The fourth design flaw was the non-
7 consideration for effective return of recycling
8 dust into the system. The dust collector hopper,
9 as you can see here in this picture, accumulated
10 approximately 138 pounds of dust mixture within
11 the first day of operation. The dust collection
12 return line accumulated additional 184 pounds.
13 This all combined for approximately 322 pounds of
14 dust which was accumulated within less than two
15 days of operation.

16 The dust return line design did not
17 thoroughly consider the physical nature of
18 chemical composition of the returning dust
19 mixture into the ink manufacturing process. If
20 this incident had not stopped the operation of
21 the process, the dust collector would have been
22 plugged within a few more days of operation.

1 The fifth major design issue was the
2 excessive accumulation of material in the duct
3 work due to low minimum conveying velocity. The
4 images shown above here reveal the amount of
5 powdery dust mixtures and sludge-like material
6 accumulation in several duct work within less
7 than two days of operation.

8 Design Issue 6 was the lack of
9 adequate system checkup at commissioning of the
10 dust collection system. The US Ink/Sun Chemical
11 over-relied on the outside contractors that
12 performed all construction and installation of
13 the new dust collector without checking on the
14 performance efficiency of the installed system
15 before accepting it. Upon accepting the dust
16 collection system US Ink did not perform any on-
17 site risk and hazard assessment or testing for
18 effectiveness before starting up the new dust
19 collection system to determine the effectiveness
20 of performance of the newly installed system.

21 Best practices required that initial
22 system testing be conducted to verify the system

1 meets the target performance parameters. For
2 example, the National Fire Protection Association
3 standards, NFPA-91 standard for exhaust systems
4 for air conveying of vapors, gases, mists and
5 non-combustible particulate solids, the 2010
6 edition, and NFPA-654 standard for the prevention
7 of fire and dust explosions from the
8 manufacturing, processing and handling of
9 combustible particulate solids, 2006 edition,
10 both recommend this type of initial system
11 testing. However, this was not the case at US
12 Ink.

13 Section 10.3.1 of the Annex of the
14 National Fire Protection Association Standard
15 NFPA-91 specifies this recommendation that when
16 installing a new system has been completed, the
17 system shall be tested to demonstrate performance
18 before acceptance by the user. The Annex
19 paragraph 8.10.3 provides a list of required
20 system tests including the following:
21 Measurement of the air volume; determination of
22 pressure drops across all components; recording

1 of the test data and design specifications; and
2 finally, comparing the obtained test data with
3 design specifications to determine whether system
4 alterations or adjustments are necessary to meet
5 specifications. The CSB found that none of the
6 recommended system tests items specified by NFPA-
7 91 as indicated above was performed by US Ink.

8 The seventh major design issue was the
9 lack of system controlling parameters for
10 operators to monitor performance and detect
11 system degradation. The CSB found that although
12 the US Ink dust collection system had some remote
13 indicators of system performance, there were no
14 information available on any of the pressure
15 gauges or other pressure devices near the mixing
16 tanks or at the bag dump station to warn the
17 operators of any performance problem. For
18 example, there was no way the operator would know
19 if there was any accumulation of material in the
20 duct work.

21 The last major design issue, No. 8,
22 the CSB found that inefficient ineffective system

1 fire protection was responsible for the incident
2 that occurred on October 9, 2012. Some chemical
3 design engineers offered ineffective fire
4 protection for the dust collection system. The
5 newly installed dust collection system was not
6 designed to prevent or extinguish fires. Several
7 aspects of the dust collection system designed
8 showed limited concentration for the likely event
9 of a fire incident even though combustible
10 materials were being transported within the dust
11 collection system.

12 For example, the US Ink mixing tanks
13 were equipped with flexible hoses of lengths 6 to
14 8 feet within the duct work and about 8 to 10
15 feet along the back of the bag dump station.
16 Recommended best practice suggests using flexible
17 hoses only to aid mobility of moving parts or
18 equipment and making length as short as possible,
19 usually not more than three feet. US Ink
20 employee testimonies revealed that the rubberized
21 flexible hoses were the first part of the system
22 to fail when the duct fire started.

1 Although the explosion suppression and
2 chemical isolation system attached to the dust
3 collector stopped an explosion, it was not
4 designed to extinguish fires. Best practices
5 recommends the inclusion of automatic fire
6 extinguishing systems such as internal sprinklers
7 in the duct work of dust collection systems.
8 CSB inspection of the ducts after the incident
9 revealed that larger ducts with cross-sections of
10 more than 75 square inches, about 9 inches in
11 diameter, did not have an automatic fire
12 extinguishing system.

13 CSB investigations revealed that US
14 Ink engineers and third party loss prevention and
15 risk management consultants hired by US Ink/Sun
16 Chemical considered the inclusion of internal
17 sprinkler protection and explosion venting within
18 the dust collector, but ultimately decided
19 against the inclusion of sprinklers due to the
20 installation of the explosion suppression and
21 chemical isolation system, as well as due to cost
22 effectiveness purposes.

1 The National Fire Protection
2 Association Standard NFPA-91, the standard for
3 exhaust systems for air conveying of vapors,
4 gases, mists and non-combustible particulate
5 solids, the 2010 edition, specifies the provision
6 of an automatic extinguishing system for portions
7 of duct work that are greater than or equal to 75
8 square inches. Incorporating sprinklers or some
9 other extinguishing systems into the larger duct
10 might have helped minimize or prevent the
11 occurrence of the flash fires on the day of the
12 incident.

13 US Ink focused its attention on
14 protecting just the dust collector at the roof
15 top with the explosion suppression and isolation
16 system. US Ink did not make additional effort to
17 protect or isolate other components of the dust
18 collection system and the equipments used in the
19 black ink manufacturing process such as the three
20 mixing tanks, the various sections of the ducts
21 and the bag dump station. This protection might
22 have likely prevented the flash fires and most

1 likely the employee injuries that resulted as a
2 result of the flash fires. If the explosion
3 suppression and chemical isolation system had
4 failed to stop the explosion in the dust
5 collector like it did on the day of the incident,
6 this incident will have been more severe.

7 At this point I'd like to turn over
8 the system management analysis section of this
9 presentation to my colleague Ms. Reepa Shroff.
10 Thank you.

11 INVESTIGATOR SHROFF: Thank you, Dr.
12 Oyewole.

13 This section discusses the analysis of
14 US Ink's safety management of the dust collection
15 system. Sun Chemical Corporation management
16 personnel did not have adequate oversight of the
17 planning, design, installation and commissioning
18 of the dust collection system. The CSB
19 identified significant management issues
20 including inadequate project oversight,
21 ineffective hazard communication and emergency
22 response planning, ineffective employee training

1 on the dust collection system, and failure to
2 develop and implement corrective actions
3 resulting from a previous incident.

4 I will now discuss a few details of
5 how the project was managed. Before design of
6 the new dust collection system the engineering
7 team filed a capital appropriations asset
8 request, or a CAAR, which allowed for plant and
9 corporate-level approval. The CAAR is required
10 under Sun Chemical project management policy and
11 was designed so that Sun Chemical could approve
12 or reject projects electronically and be able to
13 reference information in the future. The CAAR
14 indicated a process hazard analysis, or PHA, or
15 management of change, MOC, was not considered. A
16 process hazard analysis is a way to identify and
17 evaluate hazards associated with chemical
18 processes and operations to enable their control,
19 while an MOC is a written process to implement
20 changes to technology or equipment in a process.

21 During interviews with company
22 engineers and senior management CSB investigators

1 learned that the engineering team considered
2 installation of the dust collection system as a
3 replacement in kind for the old wet scrubber
4 system and therefore did not complete a PHA or
5 MOC. The new system was completely different
6 from the old wet scrubber system with different
7 functions and different design specifications, so
8 they thought they were exempt from developing and
9 following written procedures to manage the
10 changes to the new system.

11 In addition, US Ink/Sun Chemical
12 management did not seek a building permit for a
13 completely new process because they failed to
14 acknowledge that a PHA was required under US Ink
15 policy for the new process. If a PHA had been
16 conducted, this would have triggered additional
17 safety considerations including the need to
18 obtain a building permit.

19 CSB interviews with the US Ink
20 engineers revealed that US Ink/Sun Chemical
21 Corporation lacked an effective process for
22 management of organizational change. No

1 procedures were allowed for transferring and
2 retaining design knowledge and forwarding
3 information to the new engineer. A senior
4 engineer who retired from US Ink before the
5 project was completed coordinated the design of
6 the dust collection system. Upon his retirement
7 another US Ink engineer and an engineering
8 contractor assumed oversight of the project.
9 Although not fully involved in initial design of
10 the dust collection system, the new engineers
11 completed contractor hiring and equipment
12 ordering and oversaw installation of the system.
13 There is no record of adequate communication of
14 transitional knowledge concerning the hand over
15 the dust collection system from the retired
16 senior engineer to the new engineers.

17 Outside contractors who were not fully
18 involved in the design concept of the dust
19 collection system performed all construction and
20 installation activities for the new system. The
21 engineers who designed the dust control system
22 did not observe the actual installation process

1 for the system.

2 The US Ink hazard communication and
3 emergency response plan required a designated
4 fire coordinator to announce the presence of a
5 fire, location of the fire and to pull the fire
6 alarm. The plant did not require that employees
7 attempt to control a fire with an extinguisher
8 after a manually triggered fire alarm was pulled.
9 Rather, the plan required them to evacuate the
10 building immediately. During this incident no
11 fire alarm was pulled and employees attempted to
12 extinguish the fire. Employees did not evacuate
13 until after the injuries were sustained.

14 Although the sprinkler system in the
15 pre-mix room was connected to an automatic
16 audible alarm which was relayed to the East
17 Rutherford Fire Department, there was no record
18 that the automatic fire alarm provided adequate
19 notification to employees, if any. And effective
20 automatic fire alarm would have immediately
21 notified employees of the flash fires and
22 triggered and immediate evacuation.

1 Witness interviews revealed that
2 although training and fire drills were
3 occasionally conducted, the existing emergency
4 response plan was not followed on the day of the
5 incident. Fire hazard and emergency training
6 received by plant employees was inadequate.

7 The limited training provided to
8 employees did not adequately prepare them to
9 address a malfunction of the dust collection
10 system. After the initial start-up a 15-minute
11 meeting was held by the system manufacturer where
12 a walk-through of the dust collection system and
13 a brief interpretation of visual indicators was
14 provided. The meeting did not include
15 information on how the dust collection system was
16 designed to work and how to troubleshoot the
17 problems.

18 In addition, US Ink did not develop a
19 fire or explosion incident prevention program to
20 reenforce employee understanding of the potential
21 hazard severity associated with the newly
22 installed dust collection system. There was also

1 now way for pre-mix room operators to determine
2 if there were changes in performance of the
3 system.

4 A similar fire incident involving
5 ingredients overheating in a mixing tank occurred
6 at the US Ink East Rutherford facility on
7 February 29th, 2008. The East Rutherford Bureau
8 of Fire Safety and the East Rutherford Fire
9 Department responded to the fire incident at the
10 US Ink facility. According to the Bureau of Fire
11 Safety the duct work at the top of the tank was
12 consumed by flames generated during the fire. An
13 employee attempted to suppress the fire with a
14 fire extinguisher, but after failing to do so
15 exited the building. Fire fighters extinguished
16 the fire and there were no injuries from this
17 incident.

18 US Ink did not address any lessons
19 learned from this previous by discouraging
20 employees from attempting to extinguish fires in
21 an environment with flammable vapor and
22 combustible dust. In addition, US Ink did not

1 install temperature indicators and temperature
2 interlocks that would activate when the
3 temperature from the ink mixing operation became
4 too high.

5 I will now turn over this presentation
6 to my colleague Ms. Rachael Gunaratnam to discuss
7 the CSB's findings on regulatory analysis.

8 INVESTIGATOR GUNARATNAM: Thank you,
9 Ms. Shroff.

10 This section discusses the regulatory
11 framework that applied to the US Ink East
12 Rutherford facility. As we just discussed it was
13 the presence of combustible dust mixing with
14 flammable materials inside the dust collection
15 system at US Ink that led to a series of events
16 that burned the seven workers on October 9th.

17 US Ink is not the first accident
18 involving combustible dust that the CSB has
19 investigated. The CSB has been investigating
20 combustible dust incidents since 2003 when three
21 catastrophic dust incidents occurred that year
22 and claimed the lives of 14 workers.

1 The CSB launched a study and found
2 that combustible dust was not well regulated
3 though there were voluntary industry standards
4 that existed to prevent dust explosions and
5 fires. As a result, in 2006 the CSB recommended
6 to the U.S. Occupational Safety and Health
7 Administration, or OSHA, that it develop a
8 general industry standard for combustible dust.

9 The CSB recommendation to OSHA calls
10 for the agency to issue a standard designed to
11 prevent combustible dust fires and explosions and
12 to base the standard off of industry standards
13 like NFPA-654. Currently companies who handle
14 combustible dust like US Ink are not required to
15 follow these industry standards unless it is
16 required by the state in which the facility is
17 located. Without a standard OSHA is unable to
18 effectively regulate combustible dust hazards.
19 Their only mechanism to regulate these type of
20 hazards is to use the general duty clause which
21 is not as effective as an actual combustible dust
22 standard.

1 Here is a timeline of steps taken to
2 develop a combustible dust standard. In November
3 2006 the CSB made the original recommendation to
4 OSHA To develop a combustible dust rule. Three
5 years later in April 2009 OSHA announced it had
6 begun rulemaking. In September 2009, after the
7 CSB completed another combustible dust
8 investigation, the agency recommended that OSHA
9 proceed expeditiously with the dust rule. In
10 April 2010 OSHA called the dust standard long-
11 term action, but postponed some of the next steps
12 of the rulemaking process. In June 2012 OSHA
13 stated it cannot commit to a date for the
14 proposed rule, but it remains a top priority for
15 the agency. Most recently, in November 2014,
16 OSHA maintained the status of the rule as long-
17 term action on its agenda further delaying the
18 issuance of the rule.

19 The CSB continues to track and
20 investigate serious combustible dust accidents.
21 The CSB has identified 50 combustible dust
22 incidents that occurred before 2008 to 2012 which

1 resulted in 29 deaths and 161 injuries. Of those
2 50 incidents the CSB investigated 4 major
3 accidents.

4 First, in 2008 a combustible dust
5 explosion occurred at the Imperial Sugar
6 Manufacturing facility in Port Wentworth, Georgia
7 which killed 14 workers and injured 36. Then in
8 2010 a combustible dust explosion occurred at the
9 AL Solutions scrap metal processing facility in
10 New Cumberland, West Virginia which killed three
11 workers and injured one. And in 2011 three
12 separate incidents involving metal dust flash
13 fires killed five workers at the Hoeganaes steel
14 and iron powder manufacturing facility in
15 Gallatin, Tennessee. And then there was a US Ink
16 incident in 2012.

17 As a result of these investigations
18 the CSB repeated the recommendation to OSHA to
19 promulgate a standard, however this
20 recommendation is still not implemented. Had
21 OSHA issued the standard soon after the initial
22 recommendation in 2006, many of the severe

1 combustible dust incidents that followed,
2 including the US Ink incident, may have been
3 prevented.

4 OSHA has made some efforts to identify
5 combustible dust hazards. For example, it
6 revised its hazard communication standard to
7 include combustible dust in its definition of a
8 hazardous chemical. This would require employers
9 to notify their workers of the hazards of
10 combustible dust. OSHA has also intensified its
11 inspections for industries that have combustible
12 dust hazards.

13 The agency initiated a Combustible
14 Dust National Emphasis Program, which is an
15 inspection program that targets industries that
16 have combustible dust hazards. This program
17 targets certain industries that either have an
18 accident history of combustible dust incidents or
19 have the potential for the risk of a combustible
20 dust incident. These industries are identified
21 by their North American Industry Classification
22 System code, or NAIC, which is the business

1 classification.

2 The NAIC code for US Ink is the
3 printing ink manufacturing code 325910, however,
4 this code is not found on OSHA's list. This
5 industry should be on the list to be regularly
6 inspected because they use combustible dust such
7 as carbon black as part of their ink
8 manufacturing process.

9 While the intent of the National
10 Emphasis Program is to prevent an accident from
11 occurring, the NEP also provides guidance on how
12 to inspect a facility post-accident where
13 combustible dust is suspected to be the cause.
14 After the October 9th incident at US Ink OSHA did
15 a post-accident inspection and classified this
16 accident as a dust explosion, however, OSHA did
17 not issue citations related to the faulty design
18 of the dust collection system, which the CSB
19 believes to be one of the root causes of the
20 accident. Without citations addressing the root
21 causes of an accident problems may go uncorrected
22 and accidents may reoccur.

1 The CSB continues to investigate
2 combustible dust incidents like US Ink and
3 advocates for a federal standard to demonstrate
4 the seriousness of this hazard. In a July 2013
5 public meeting the CSB voted to change the status
6 of the OSHA recommendation as an unacceptable
7 response for delaying the development of a
8 federal standard. The Board also voted in that
9 meeting to make combustible dust hazards its
10 first item in the CSB's Most Wanted Chemical
11 Safety Improvement Program.

12 In the absence of an OSHA standard
13 states must rely on their own regulations, but in
14 New Jersey no state agency regulates combustible
15 dust hazards. When US Ink began the construction
16 of the dust collection system they had to obtain
17 a number of permits. The company did obtain an
18 environmental permit under New Jersey's Air
19 Pollution Control regulations. This type of
20 permit required that the dust collection system
21 be able to control emissions to the outdoor
22 environment. This type of permit does not

1 regulate the safety of the equipment and prevent
2 a combustible dust fire and explosion.

3 US Ink was also required to obtain a
4 construction permit under New Jersey's Uniform
5 Construction Code, or UCC. This code is overseen
6 by the New Jersey Department of Community Affairs
7 which has the authority to promulgate or modify
8 the regulations of the UCC. This state agency
9 also provides guidance and technical assistance
10 to local building officials who enforce the UCC
11 in their jurisdiction.

12 New Jersey's UCC was promulgated in
13 1975 as a single mandatory construction code.
14 The intent, as stated in its own code provisions,
15 is to ensure the health, safety and welfare of
16 occupants or users of buildings and structures,
17 and they do this through the adoption of sub-
18 codes such as a building or electrical code
19 requiring companies to obtain a construction
20 permit.

21 US Ink was required to but did not
22 obtain a construction permit for the new dust

1 collection system because the company
2 misinterpreted the code thinking they were exempt
3 from its requirements. Therefore, local code
4 officials never learned of the new construction
5 of the dust collection system.

6 The CSB investigation found that New
7 Jersey only required a permit for the new
8 electrical and structural changes associated with
9 the construction of the dust collection system,
10 but not for the engineering design of the dust
11 collection system. The CSB found that the New
12 Jersey UCC actually exempts manufacturing,
13 production and process equipment from the permit
14 process. Because the dust collection equipment
15 at US Ink was being used as part of the ink
16 manufacturing process, it appeared to qualify for
17 this exemption.

18 An 1992 New Jersey notice provided an
19 interpretation of that exemption stating that
20 process equipment is often unique to its function
21 and designed beyond the reference standards in
22 the UCC. This makes it impractical or impossible

1 for code officials to review it in an appropriate
2 way. They do however review electrical, water
3 and sanitary connections to such process
4 equipment as these can affect public safety. At
5 that time there were no engineering or fire
6 protection standards referenced in the UCC, and
7 local code officials do need these standards to
8 appropriately inspect process equipment.

9 However, in 2010 New Jersey adopted an
10 amended form of the International Building Code
11 which is a model building code that is adopted
12 throughout most of the United States. This code
13 applies not only to the physical structure, but
14 also to the use and occupancy of the building and
15 includes the equipment inside the building. The
16 International Building Code references industry
17 standards that apply to specific occupancies
18 giving local code officials guidance on how to
19 inspect these buildings. For example, the
20 International Building Code requires that
21 buildings and structures that pose a deflagration
22 hazard or a hazard from accelerated burning from

1 materials such as combustible dust follow
2 reference standards such as NFPA-654.

3 If the dust collection at US Ink had
4 been covered under New Jersey's UCC, the
5 provisions of the International Building Code
6 would have applied. This would have required US
7 Ink and other facilities handling combustible
8 dust to design their equipment in accordance with
9 standards such as NFPA-654.

10 I will now turn to the investigation
11 key findings.

12 1) A flammable mixture consisting of
13 hydrocarbons and combustible dust accumulated in
14 the duct work during the start up of US Ink's
15 dust collection system. The mixture
16 spontaneously igniting leading to a series of
17 events that caused a flash fire burning seven
18 workers.

19 2) The original design of the dust
20 collection system was intended strictly for dust
21 collection, but was modified before commissioning
22 to include a housekeeping function. This also

1 caused insufficient flow rate and contributed to
2 an accumulation of a flammable mixture in the
3 duct system.

4 3) System controls such as temperature
5 and pressure indicators were not installed for
6 operators to monitor the mixing tanks and dust
7 collection system during start-up. This led to
8 the overheating of the flammable dust mixture
9 which accumulated in the duct work and ignited
10 above T-306.

11 4) US Ink/Sun Chemical Corporation did
12 not provide adequate oversight into the planning,
13 design, installation and commission of the dust
14 collection system. As a result, safety
15 management elements such as a process hazard
16 analysis and management of change procedures were
17 not conducted.

18 5) No processes were in place to
19 confirm adequate start-up or commissioning of the
20 dust collection system. As a result, the
21 blockage of the duct work went undetected and
22 design flaws were not revealed until after the

1 flash fire occurred.

2 6) US Ink's hazard communication
3 emergency response plan and other incident
4 prevention programs did not reenforce an
5 understanding of the potential hazard associated
6 with flammable vapors entering the dust
7 collection system and mixing with the combustible
8 dust.

9 7) US Ink/Sun Chemical Corporation did
10 not obtain a construction permit for the
11 installation of the new dust collection system.

12 8) No federal agency or state agency
13 in New Jersey regulates combustible dust hazards.

14 9) A comprehensive OSHA federal
15 regulation specific to combustible dust is needed
16 because the reliance on industry to voluntarily
17 comply with fire protection and engineering
18 standards is insufficient to control combustible
19 dust hazards.

20 10) OSHA did not include the NAIC code
21 for printing ink manufacturing 325910, the
22 industry classification code for US Ink, to its

1 list of industries in the combustible dust NEP.
2 OSHA inspectors refer to this list as guidance on
3 inspections for combustible dust hazards in their
4 region.

5 11) The New Jersey Uniform
6 Construction Code adopts the International
7 Building Code which does reference fire
8 protection and engineering standards for
9 facilities that handle combustible dust such as
10 NFPA-654, however, the UCC exempts certain
11 process equipment that could apply these
12 provisions.

13 12) The New Jersey Department of
14 Community Affairs conducts training for local
15 building code officials on some the NFPA
16 standards in the New Jersey UCC, but does not
17 provide training on relevant NFPA standards that
18 address combustible dust hazards.

19 I will now turn it over to Mr. Banks
20 who will discuss the recommendations.

21 INVESTIGATOR BANKS: Thank you, Ms.
22 Gunaratnam.

1 As a result of this investigation the
2 investigative team is proposing that the CSB
3 reiterate one of its previous recommendations to
4 the Occupational Safety and Health
5 Administration, or OSHA, and issue eight new
6 recommendations, two to OSHA, three to US Ink and
7 three to the New Jersey Department of Community
8 Affairs.

9 First, I will discuss recommendations
10 the staff proposes for reiteration.

11 The CSB continues to believe that the
12 OSHA general industry standard for combustible
13 dust is needed to prevent future tragedies caused
14 by dust explosions. Therefore, the staff are
15 proposing that the Board reiterate its 2006
16 recommendation calling for the development and
17 issuance of an OSHA general industry standard for
18 combustible dust. As Ms. Gunaratnam mentioned,
19 the Board voted to designate this recommendation
20 and three related recommendations with the status
21 open, unacceptable response in July of 2013.

22 The Board also voted at that time to

1 designate a general industry standard for
2 combustible dust as the agency's first most
3 wanted chemical safety improvement. It should
4 also be noted that this will be the first time in
5 the history of the agency that the CSB has
6 reiterated one of its safety recommendations.

7 The text of the reiterated
8 recommendation No. 2006-1-H-1 is as follows: As
9 an OSHA general industry standard for combustible
10 dust is needed to prevent future tragedies, the
11 CSB is reiterating its 2006 recommendation to
12 OSHA which is currently designated with the
13 status open, unacceptable response. A dust
14 standard is the first item on the CSB's most
15 wanted safety improvement list. This
16 recommendation was reiterated by CSB in the AL
17 Solutions investigation. So we have reiterated
18 this recommendation at the AL Solutions
19 investigation closing.

20 Now the new recommendations. We have
21 a recommendation to OSHA. R-1 is to add the
22 North American Industry Classification System, or

1 NAICS, Code 325910, printing ink manufacturing,
2 to the list of industries in Appendix D-1 or
3 Appendix D-2 of Combustible Dust NEP Program
4 Directive CPL-03-00-008.

5 Recommendation R-2 to OSHA.

6 Communicate with all OSHA area offices to
7 encourage appropriate application of the
8 following existing provisions of Combustible Dust
9 NEP Program Directive CPL-03-00-008, Paragraph 9,
10 Section (a)(2) which indicates that the area
11 offices may add their NEP establishment list to
12 those facilities in their jurisdiction with the
13 Standard Industrial Classification System Code,
14 or a NAICS code, or both, other than those listed
15 in Appendix D-1 and D-2 of the Combustible Dust
16 NEP Program Directive if those facilities have a
17 known pattern of combustible dust hazards.

18 Paragraph 9, Section (b)(4) indicates
19 that if a fatality or a catastrophe investigation
20 is performed at a facility because of a
21 combustible dust deflagration or explosion, the
22 inspector shall use the guidelines of the

1 Fatality Catastrophe Investigation Procedures
2 Directive CPL-02-007-137 and in Combustible Dust
3 NEP Directive CPL-03-00-008.

4 The first proposed recommendation to
5 the New Jersey Department of Community Affairs
6 reads as follows: "Revise the exemption for
7 manufacture, production and process equipment
8 under the New Jersey Uniform Construction Code,
9 NJAC 5:23-2.14 and require equipment that is not
10 already covered by a federal standard to be
11 covered under the New Jersey UCC. Also provide
12 authority to allow local code officials to
13 solicit third party certified professionals to
14 evaluate the type of equipment."

15 The second proposed new recommendation
16 to the New Jersey Department of Community
17 Affairs, R-4, is develop and implement training
18 for local code officials on the National Fire
19 Prevention Association, or NFPA, standards
20 referenced in the New Jersey adoption of the
21 International Building Code, or IBC, for
22 occupancies with a high-hazard classification of

1 group H. Specifically include training on
2 equipment that handles combustible dust and the
3 hazards involved.

4 The third proposed new recommendation
5 for the New Jersey Department of Community
6 Affairs, No. R-3, reads: "Promulgate a regulation
7 that requires all occupancies handling hazardous
8 materials to inform the local enforcement agency
9 of any type of construction or installation of
10 equipment in an industrial or manufacturing
11 facility. Also, require that the local
12 enforcement agencies evaluate that information to
13 determine whether a construction permit is
14 required."

15 The first proposed recommendation to
16 US Ink/Sun Chemical Corporation, R-6, reads as
17 follows: "At the US Ink East Rutherford facility
18 install automatic fire alarms consistent with
19 NFPA-72, or the National Fire Alarm Code, in
20 manufacturing areas such as mixing where heat
21 generation could occur."

22 The second proposed recommendation to

1 US Ink/Sun Chemical Corporation reads: "Revise
2 the capital appropriations request, or CAR, form
3 procedure for new installations and modifications
4 to existing equipment to require at a minimum the
5 following: Process hazard analysis, or PHA;
6 management of change, or MOC; review of
7 engineering drawings for permits; safety
8 management of contractors; training of plant
9 operators based on applicable dust collection
10 systems guidelines and standards including NFPA-
11 91 and NFPA-654."

12 And the last proposed recommendation
13 to the US Ink/Sun Chemical Corporation, R-8, is
14 develop and implement a management organizational
15 change protocol to allow for the transfer of
16 knowledge and information to new personnel. At a
17 minimum include initial or refresher training in
18 the following: Safety and health procedures,
19 lessons learned from previous incidents,
20 technical information for equipment and routine
21 plant operations.

22 Now this concludes the staff's

1 presentation of the CSB investigation of the US
2 Ink incident, and I will now turn the meeting to
3 CSB Chairperson Dr. Moure-Eraso.

4 CHAIRPERSON MOURE-ERASO: Thank you
5 very much, Mr. Banks. I think we'll proceed with
6 the agenda with Board questions to the
7 investigators. So I start with Mr. Ehrlich.

8 Mr. Ehrlich, do you have any
9 questions?

10 MEMBER EHRLICH: Yes, I have a couple
11 of questions. Well, it's a two-part question.
12 Was the source of ignition every identified and
13 was there adequate data to show that the system
14 was properly grounded to rule out possible static
15 discharge with all those hoses?

16 INVESTIGATOR BANKS: We were not able
17 to pinpoint the point of origin for the fire.
18 There were several indicators of where the fire
19 most likely occurred, an eyewitness recount of
20 his activity and the actions at the bad dump.
21 The equipment itself was properly grounded.

22 MEMBER EHRLICH: Okay. It was stated

1 clearly that the emergency response plan said
2 that they pull the alarm and evacuate the
3 facility. Who made the decision to send people
4 into fight the fire? Had they had previous fire
5 fighting training?

6 INVESTIGATOR BANKS: The alarm did not
7 go out to the entire building. As we understand
8 it could be heard in the control room. The
9 decision to attempt to extinguish the fire, the
10 gentleman took it upon himself to approach the
11 fire with an extinguisher and attempt to
12 extinguish the fire. There was fire emergency
13 training that was offered by the plant prior to
14 the incident.

15 MEMBER EHRLICH: And was there an
16 emergency coordinator involved in this whole
17 operation?

18 INVESTIGATOR BANKS: The emergency
19 coordinator is designated to be the supervisor,
20 and in this instance they were assessing the
21 fire, the flames that were observed in the pre-
22 mix room. And before they could evacuate the

1 flash fire washed over them. We feel that had
2 there been a louder alarm that all of the
3 employees could have heard, they would have more
4 likely evacuated.

5 MEMBER EHRLICH: I see. Thank you.

6 CHAIRPERSON MOURE-ERASO: Mr. Griffon?

7 MEMBER GRIFFON: Yes, just a couple
8 questions given the time of night here. I'm
9 curious just to maybe go over this or emphasize
10 this. I think you might have mentioned it in the
11 presentation, but was the company complying with
12 the current NFPA Standards 91 and 654 prior to
13 the incident?

14 INVESTIGATOR BANKS: As required under
15 those guidelines, yes.

16 MEMBER GRIFFON: Okay. And then so if
17 they were complying with those and the incident
18 still occurred, then did you identify any gaps or
19 deficiencies in those two standards, 91 or 654?

20 INVESTIGATOR BANKS: None that we were
21 able to bring to the fore in this case.

22 MEMBER GRIFFON: Okay. I mean, I'm

1 just trying to get a sense of if those standards
2 are in place and this incident still, happened it
3 seems something might be wrong with those
4 standards or it might need to be further
5 considered. That's all I'm exploring.

6 INVESTIGATOR BANKS: Okay.

7 MEMBER GRIFFON: Another question:
8 You mentioned in Finding 1 hydrocarbons and dust
9 being present, and I'm wondering if you classify
10 this as a hybrid incident, a hybrid dust/vapor
11 event.

12 INVESTIGATOR BANKS: There were
13 multiple possible causes for this event. You had
14 the oils that were used in the process, you had
15 the Gilsonite, the carbon black. They were all
16 possible contributors. The proximity of the
17 flames observed after the initial flash and the
18 subsequent sound and action on the roof. The
19 material that we found in the duct work
20 afterwards was a mixture of an oily powdery
21 substance that had adhered to the inner surfaces
22 of the duct work. So the attempt was made to

1 replicate some type of a hybrid incident in a
2 lab, and we weren't able to reproduce it to that
3 extent that we could say absolutely that it was a
4 hybrid event.

5 MEMBER GRIFFON: Okay. And did the
6 company in their planning prior to the incident
7 consider a potential for a hybrid situation? I
8 don't know if they considered that. I didn't
9 notice it in the report.

10 INVESTIGATOR OYEWOLE: We don't have
11 any record of that that the company actually did
12 any concentration --

13 MEMBER GRIFFON: Okay.

14 INVESTIGATOR OYEWOLE: -- for the
15 hybrid type of mixture.

16 MEMBER GRIFFON: And the last question
17 is just we did some testing and I wondered if
18 prior to the incident if the company tested the
19 Gilsonite material or other materials for
20 combustibility.

21 INVESTIGATOR BANKS: Yes, they had
22 information that indicated the explosibility of

1 the material that had been tested prior to, and,
2 as we found afterwards in our tests, there was a
3 difference in the explosibility of that material.

4 MEMBER GRIFFON: Okay. And I assume
5 their results were below --

6 INVESTIGATOR BANKS: A little bit
7 lower.

8 MEMBER GRIFFON: -- their design
9 specifications of 165 --

10 INVESTIGATOR BANKS: Yes.

11 MEMBER GRIFFON: -- for the -- okay.

12 INVESTIGATOR BANKS: Yes.

13 MEMBER GRIFFON: All right. Thank
14 you.

15 INVESTIGATOR BANKS: You're welcome.

16 CHAIRPERSON MOURE-ERASO: Thank you.
17 I only have one question for the team. How
18 prevalent are those explosions and what specific
19 studies the CSB has done to find that prevalence?

20 INVESTIGATOR BANKS: Well, it's
21 extremely widespread and troubling and continues
22 to occur. There's a wide range of material

1 that's involved in these type of events from
2 pharmaceutical dust to sugar to metal to any
3 number of different powdery materials that are
4 combustible. And over the years we've conducted
5 a dust study that initiated in 2003, and
6 recommendations were issued in 2006 to address
7 that problem. Subsequent to that there have been
8 incidents at Imperial Sugar, at Hoeganaes, at AL
9 Solutions. The numbers of tragic outcomes from
10 these events is staggering.

11 In this incident the victims were
12 burned, but they could walk out on their own
13 afterwards, so it wasn't as bad as it could be.
14 But the problem is prevalent and the efforts of
15 this agency to address that have continued
16 throughout my tenure to try to be a voice of
17 reason that there is a profound need for some
18 type of comprehensive dust standard to provide a
19 greater sense of awareness of the risk, that's
20 more programmatic in how the inspections are
21 done, to give folks a sense that the material
22 that they're working with exactly how volatile it

1 is and to respect it.

2 CHAIRPERSON MOURE-ERASO: And if I
3 remember well, I guess we were able to follow in
4 a period of 10 years about 50 incidents with
5 fatalities.

6 INVESTIGATOR BANKS: That's correct.
7 Yes, 50 incidents with I think 29 fatalities.

8 CHAIRPERSON MOURE-ERASO: Thank you
9 very much.

10 INVESTIGATOR BANKS: Sure.

11 CHAIRPERSON MOURE-ERASO: Okay. I
12 think we've finished this part of the program,
13 and I am asking Dr. Horowitz if he could step
14 forward to moderate the public comments.

15 INVESTIGATOR BANKS: Mark, Just a
16 point of correction. They were not following
17 NFPA-654 at the site. So I mis-spoke on that.
18 My apologies.

19 MEMBER GRIFFON: Thank you. Yes, I
20 think that's important.

21 INVESTIGATOR BANKS: Yes.

22 MEMBER GRIFFON: That's for that

1 clarification, because it was a little concerning
2 to hear that if they were complying with all
3 these standards and it still happened, so --

4 INVESTIGATOR BANKS: Yes.

5 MEMBER GRIFFON: Thank you. Thank
6 you.

7 INVESTIGATOR BANKS: Yes. Sure.

8 CHAIRPERSON MOURE-ERASO: But and you
9 call it a standard? Is that the correct
10 terminology? I think they are guidelines.

11 PARTICIPANT: Well, industry
12 voluntarily -- yes.

13 CHAIRPERSON MOURE-ERASO: Yes, it's a
14 guideline. Yes.

15 PARTICIPANT: A guideline. Yes,
16 right.

17 DR. HOROWITZ: Thank you, Mr.
18 Chairman. The first commenter is Bruce Johnson
19 (phonetic) from the International Code Council.

20 Mr. Johnson?

21 MR. JOHNSON: Good evening, Chairman
22 Moure-Eraso, Chemical Safety Board members and

1 staff. My name is Bruce Johnson and I'm the vice
2 president and government relations for the
3 International Code Council, or ICC.

4 ICC is a membership association
5 dedicated to building safety, fire prevention,
6 energy conservation and sustainability. The ICC
7 develops model building constructions code and
8 fire safety codes used to construct most
9 residential and commercial buildings and ensure
10 those buildings remain safe throughout their
11 useful life. It is the mission of the ICC to
12 provide the highest quality codes, standards,
13 products and services for all concerned with the
14 safety and performance of the built environment.

15 The family of correlated ICC codes,
16 called the I-Codes, undergo a triennial review
17 and revision process that is an open an
18 consensus-base code development forum. Our code
19 development process considers new building and
20 fire safety data and research reports, the latest
21 technology, installation techniques, new building
22 products and methods, along with cost and

1 affordability in producing published model codes
2 every three years.

3 Most U.S. cities, counties and states
4 that adopt codes choose the International or I-
5 Codes developed by the ICC. The 2009
6 International Building Code, IBC, and the
7 International Fire Code, IFC, with New Jersey
8 amendments are among the model codes adopted and
9 enforced by the State of New Jersey. The
10 International Building Code is a model
11 construction code that establishes minimum
12 requirements for a reasonable level of safety,
13 public health and welfare through structural
14 strength and stability, adequate occupant egress
15 and safety for occupants and fire fighters, as
16 well as the protection of property from fire and
17 other hazards attributed to the built
18 environment.

19 The International Fire Code, or IFC,
20 is a model construction and maintenance code that
21 establishes minimum fire safety levels for both
22 new and existing buildings. The intent of the

1 IFC establishes minimum requirements for all
2 commercial buildings consistent with nationally-
3 recognized good practice for providing a
4 reasonable level of occupant safety, property
5 protection from hazards of fire, explosion,
6 dangerous conditions, and also to provide for the
7 safety of fire fighters and emergency responders
8 during emergency operations.

9 The IBC and IFC are designed to work
10 together as a correlated system to address
11 minimum levels of safety for the construction of
12 new buildings and the maintenance of that minimum
13 level of safety for the life of the building.

14 ICC believes that the most effective
15 method for states to ensure their built
16 environment remains safe, sustainable, affordable
17 and resilient is through adopting up-to-date
18 model construction and fire safety codes and
19 having a system in place for the administration
20 and enforcement of those adopted codes for all
21 buildings. This includes compliance and
22 commissioning inspections of buildings as they

1 are being constructed and periodic inspections of
2 existing buildings for compliance with the IFC to
3 ensure the minimum required fire and life safety
4 levels are always maintained.

5 The IBC has specific construction
6 requirements for high-hazard occupancies and also
7 references the IFC for fire safety requirements
8 in these buildings. The IFC contains
9 requirements for the storage, use and handling of
10 all hazardous materials such as combustible dust
11 in both new and existing buildings including
12 those classified as high-hazard and other
13 manufacturing facilities such as factory or
14 storage occupancies.

15 Since the CSB investigation report and
16 recommendations based on the dust explosion at
17 the Hoeganaes facility in Gallatin, Tennessee
18 were released in 2011, new combustible dust
19 hazard mitigation requirements have been added to
20 the 2012 International Fire Code. The ICC Fire
21 Code Action Committee is continuing to develop
22 code change proposals for the 2018 IFC that

1 further address the mitigation of combustible
2 dust hazards and incorporation of IFC references
3 to applicable safety standards such as those
4 developed by the NFPA.

5 ICC has also taken steps to include a
6 specific focus on the hazards of combustible dust
7 in our training programs delivered to thousands
8 of code officials every year. These education
9 programs now include information and
10 illustrations of combustible dust hazards along
11 with an explanation of the IBC and IFC
12 requirements that address mitigation of those
13 hazards. It is our hope that this education of
14 code officials will improve the enforcement of
15 combustible dust safety requirements and thereby
16 help prevent combustible dust deflagrations and
17 flash fires.

18 In conclusion, the ICC would like to
19 thank the Chemical Safety Board for its thorough
20 accident investigation reports and the
21 recommendations that are essential to improving
22 safety of our built environment. ICC will

1 continue to work with the CSB to ensure that the
2 recommendations aimed at improving the safety
3 requirements of the I-Codes are considered in our
4 ongoing code development process.

5 I'd like to thank the Chemical Safety
6 Board for the opportunity to offer these comments
7 this evening and I would be happy to answer any
8 technical questions about the ICC or our model
9 codes. Thank you.

10 DR. HOROWITZ: Thank you, Mr. Johnson.

11 CHAIRPERSON MOURE-ERASO: Thank you
12 very much.

13 DR. HOROWITZ: Next is Ashley
14 (phonetic) Fitch, United Steel Workers.

15 Ms. Fitch? An could you please spell
16 your name for the transcriber?

17 MS. FITCH: Sure. F-I-T-C-H. Good
18 evening, Chairman, members of the Board. Thank
19 you for the opportunity to comment today.

20 My name is Ashley Fitch and I join you
21 on behalf of the United Steel, Paper and
22 Forestry, Rubber, Manufacturing, Energy, Allied

1 Industrial and Service Workers International
2 Union, more commonly known as the USW. We
3 represent 850,000 workers in the United States
4 and Canada. Our members work in sectors I just
5 mentioned above and in many others, including the
6 majority of unionized workers in the paper and
7 metal industry and hundreds of thousands of men
8 and women whose jobs expose them to combustible
9 dust hazards.

10 The explosion in 2012 at the US Ink
11 facility in East Rutherford, New Jersey injured
12 seven people. The lives of these workers are now
13 changed forever. They suffer more than just
14 physically. The occurrence at US Ink will affect
15 these victims and their families for the rest of
16 their lives. The severity of this explosion
17 could have been greater. The damage to this
18 community and its infrastructure could have been
19 more greatly altered due to a chemical dust
20 explosion or fire.

21 The USW does not represent the workers
22 at US Ink, however, we do represent many workers

1 who are today and every day exposed to
2 combustible dust hazards. USW members, just as
3 the workers of US Ink, are highly skilled and
4 highly trained workers who operate and maintain
5 various manufacturing facilities across the
6 nation. And to further protect these workers
7 there must be further regulation and awareness of
8 potential catastrophic explosions and fires to
9 occur due to this type of hazard.

10 We have worked closely with the
11 Chemical Safety Board and would like to take this
12 opportunity to strongly support the
13 recommendations related to the prevention of
14 combustible dust fires and explosions. We also
15 support the CSB's highlighting the need and
16 necessity of further regulation on the subject in
17 light of OSHA's failure to move forward with a
18 combustible dust standard. We encourage the CSB
19 to work collaboratively with OSHA to facilitate
20 the agency's progress on combustible dust to
21 protect workers across the country.

22 Since 1923 when the NFPA published the

1 first national consensus standard on the
2 prevention of dust explosions in grain and flour
3 mills these hazards associated with combustible
4 dust has not been unknown. In 2009 OSHA reported
5 that loss from these explosions of fires affected
6 350,000 companies across the nation. These
7 tragedies are becoming all too familiar for the
8 working men and women of this country. Each of
9 these accidents could have been prevented with
10 proper regulation to employers and regulations to
11 prevent these catastrophic accidents.

12 Today the Board has shared information
13 gathered during their inspection. These findings
14 provide lessons learned to all facilities within
15 this industry to prevent it from reoccurring, but
16 will the findings of this recommendation of the
17 CSB be enough to impact the risk of another
18 explosion or fire? No. Therefore, we strongly
19 urge the Board to continue to shed light on these
20 catastrophic accidents and draw attention to
21 these regulatory gaps. Thank you.

22 CHAIRPERSON MOURE-ERASO: Thank you.

1 DR. HOROWITZ: Thank you, Ms. Fitch.

2 Next is Paul Hofmann. And, Mr.

3 Hofmann, please spell your first and last name

4 for the recorder. Thank you.

5 MR. HOFMANN: Well, Paul is P-A-U-L.

6 And Hofmann is H-O-F-M-A-N-N, one F and two Ns.

7 I thank the Board for giving me the

8 opportunity to speak on behalf of my three

9 clients, two of whom are here. All three were

10 individuals that were burned, seriously injured

11 in the event at Sun Chemical's US Ink facility.

12 I have several comments that I wish

13 the Board to think about before it makes its

14 final vote on the report.

15 The first one is a comment that the

16 report unfortunately was released this afternoon

17 for me to be able to review, so I really didn't

18 have an adequate time to fully review it. From

19 my initial review, though, I do want to commend

20 the Board for the thoroughness of the

21 investigation. I would have liked more time to

22 have reviewed it, and I think that in the next

1 time that you have such a hearing, please give
2 the public a little bit more time to digest what
3 the proposed findings would be.

4 That being said, there is one area
5 that I do quarrel with on behalf of my clients
6 with a certain conclusion that was reached, and I
7 would like the members before you vote to
8 consider.

9 The conclusion is that the initial
10 flash fire and the thump that was heard was the
11 suppression and isolation system going off. I
12 don't think that the report fully justifies that
13 conclusion. An alternate explanation of the
14 thump that was heard could have been the actual
15 first initial flash fire that was observed coming
16 out of the bag dump and there's no justification
17 necessarily to conclude that the suppression and
18 isolation system went off at that time.

19 I think an alternate explanation would
20 be that the initial flash fire did initiate
21 further burning in the duct work and that since
22 the blower continued to draw air through the

1 system that embers from the smoldering fire in
2 the duct work then were drawn up into the dust
3 collector setting off an explosion in the dust
4 collector which the suppression and isolation
5 system then attempted to prevent. Unfortunately,
6 I think the conclusion could easily be reached
7 that the deflagration that came out of the dust
8 collector was not suppressed and was not isolated
9 as supposedly it was intended to be and that that
10 flame front that came out of the dust collector
11 is what burned my clients.

12 An alternate explanation is that in
13 that second and much more serious flame front
14 that burned my clients, that perhaps the system
15 did also go off and it was the isolation system
16 pushing in a back pressure situation the flaming
17 material from the duct work which burned my
18 clients rather than the suppression and isolation
19 system having gone off minutes before. And
20 before you make your final vote I think that
21 needs to be analyzed.

22 I think another important thing that

1 seems to be missing from the conclusions here is
2 you have a situation where this was a brand new
3 system; and it's mentioned numerous times in the
4 report that this was a new system, and this was
5 certainly in part poorly engineered as to the
6 duct work, etcetera, and I agree with that
7 conclusion. But I disagree with the total
8 emphasis on Sun Ink as being the progenitor of
9 the problems.

10 Sun Ink hired and involved numerous
11 contractors that were expert in the field of dust
12 collection. They hired the United Air Systems to
13 produce the dust collector itself. They hired
14 Fike (phonetic) and SSI (phonetic) to incorporate
15 a sensing system plus suppression and isolation.
16 They hired another contractor called Faber
17 (phonetic), which is an engineering firm, to
18 assist it. There is no mention about the four of
19 these entities working together. There is one
20 little footnote that mentions that there were
21 some other contractors.

22 And I think that a conclusion or a

1 recommendation from this Board must be that all
2 entities involved in the design and construction
3 of these dust collector systems must all analyze
4 the safety issues and not just rely on the
5 manufacturer, although that's an easy target.
6 But UAS, Faber, Fike, SSI all were involved in
7 the design of this system. They were also --
8 they either were or should have been; and I
9 believe that they were, aware of the fact that
10 there were the volatile chemicals that were
11 involved and they did not take into account the
12 potential fire hazard and explosion hazard that
13 the volatile chemicals would also be involved.

14 And so, I think that there is a lack
15 in the proposed report as to who else should have
16 -- should have -- and the recommendation should
17 be that other entities should also be involved in
18 analyzing before a system is put into place.
19 Everyone that's involved in the design should
20 look at it from a safety standpoint, particularly
21 those entities that are recognized as experts in
22 the industry.

1 So I want to thank you for that and
2 hope that you consider my comments.

3 DR. HOROWITZ: Thank you. Next is
4 Professor Glenn Corbett.

5 PROF. CORBETT: It's Glenn Corbett,
6 two Ns and two Ts, for the recorder.

7 Mr. Chairman, members of the Board and
8 staff, thank you for allowing me to speak
9 tonight. I'm not sure what's going on next door,
10 but something's happening there.

11 Tonight just for the purposes of full
12 disclosure, I've worked for the Board as a
13 consultant on other projects. And also tonight
14 I'm not speaking on behalf of my college or the
15 New Jersey State Fire Code Council, which I sit
16 on. I'm speaking on my own behalf tonight.

17 I'd like to focus on a couple of the
18 recommendations, which by the way are incredibly
19 important. These are two excellent reports that
20 we heard tonight and the actual recommendations,
21 as we all know, are so crucial.

22 The first one is the gap that the

1 Board has identified in New Jersey's regulations
2 dealing with combustible dust. It's clear; we
3 heard from Bruce Johnson earlier, that the model
4 codes intend for jurisdictions who adopt their
5 codes to actually have a role in oversight and
6 inspection of these systems. These systems,
7 while they may play a role in terms of
8 environmental protection, they're also the code
9 enforcer there for obvious reasons in terms of
10 the potential for an explosion in the dust
11 accumulation scenario. In particular, the
12 exemption that New Jersey provides for these
13 systems has to be closed or should be removed.
14 We have to close that gap and get rid of that.
15 So again, I'd like to really strongly endorse
16 that particular recommendation.

17 Also the recommendation that's in the
18 existing codes for NFPA-654. It's a fire
19 protection standard. It's a standard for this
20 kind of situation. And of course it wouldn't be
21 there if it wasn't important to actually enforce,
22 right? So we shouldn't have something that's in

1 the code that we're going to exempt people from.
2 So that's important.

3 The other really important provision
4 in the recommendation you've made deals with the
5 issue of training. East Rutherford is a small
6 community. I also have to disclose I'm a
7 resident of this county, Bergen County, at the
8 north end. Sixty-nine communities. Sixty-nine
9 fire departments. We're all small towns. And a
10 lot of these communities don't have a lot of
11 technical expertise.

12 And I think it's important -- I think
13 Investigator Banks mentioned, which I think
14 perhaps should go in your recommendation
15 specifically, is that there should be
16 encouragement for local jurisdictions to use the
17 sections in the code that allow for special
18 expertise to be brought in at the behest of that
19 inspecting agency and paid for by the developer
20 or whoever is actually going to propose this
21 particular installation. That section in Chapter
22 1, Section 103 allows for again that special

1 expertise to be brought in, provide a report to
2 the local people to make sure that they
3 understand exactly what the system is going to do
4 and if there are any issues with that system
5 design they provide that independent expertise.

6 I've used it in my own career. I
7 spent 10 years in code enforcement in Texas, San
8 Antonio and Austin, and there are occasions where
9 none of us can know everything about everything,
10 right? So we brought in consultants to help us
11 understand on particularly complicated situations
12 what to do. And I think I would suggest that
13 that be put in the report specifically that
14 jurisdictions should be encouraged to use that
15 particular provision of the code.

16 So again, thank you all so much for
17 your hard work, both the Board and the staff.
18 And I'd also be happy answering questions later
19 on. Thank you.

20 DR. HOROWITZ: Thank you. Eric
21 (phonetic) Frumin, Change to Win Labor Coalition.

22 MR. FRUMIN: My name is Eric Frumin,

1 F-R-U-M-I-N. I'm the health and safety director
2 for Change to Win, which is a national labor
3 federation that includes the Teamsters Union and
4 several other unions. First, I just want to
5 express my feelings of -- well, regret for the
6 suffering that the workers at the US Ink have had
7 to endure and their families, and even the people
8 who weren't injured. I'm sure it continues to be
9 a difficult experience to go back there every
10 day.

11 I had a couple of questions about the
12 report and the investigation, and then I want to
13 say a little bit about the historical context for
14 some of the issues that we're dealing with today.

15 So I just want to confirm what year
16 the change in the system was implemented. I
17 don't actually see that in the report, so it's
18 not clear. What year was the CAR approved and
19 therefore what were the applicable voluntary
20 standards in NFPA? What version of them were
21 applicable at the time? So do you know what year
22 the change was done?

1 INVESTIGATOR BANKS: Well, we don't
2 have that information at our fingertips. We're
3 happy to get that and provide it you at a later
4 time.

5 MR. FRUMIN: Well, I think it would be
6 useful for the reader of the report for you to
7 just have that in there, because you make
8 reference to NFPA-654 in 2006, or the earlier
9 version. And we might as well know at that time
10 had they applied the management system tools and
11 used the applicable standards, which standard
12 they would have used.

13 So, Mr. Hofmann, do you happen to know
14 what year it was just --

15 MR. HOFMANN: Well, they started the
16 process in 2011 and in 2012 the final decisions
17 were made.

18 MR. FRUMIN: Okay. So, you know,
19 these were very recent, so we have an idea
20 informally anyway. Perhaps you could confirm it
21 and put that in the report what year that was.

22 I wanted to just confirm what the

1 sequence was for the alarm system. Was there a
2 point at which an alarm was activated which had
3 it been properly designed would have alerted not
4 only the other people in the plant and perhaps
5 triggered an evacuation, but also alerted the
6 East Rutherford Fire Department? Do you recall
7 what the sequence was, when that alarm actually
8 occurred in relationship to the different fires?

9 INVESTIGATOR BANKS: The alarm was
10 activated with the deployment of the suppression
11 system and the alarm could be heard in the
12 control room. It just wasn't heard plant-wide.

13 MR. FRUMIN: So roughly how long was
14 it after the --

15 INVESTIGATOR BANKS: It was --

16 MR. FRUMIN: -- suppression system
17 before the flash fire hit them?

18 INVESTIGATOR BANKS: The notification
19 would go to the East Rutherford Fire Department
20 almost at that same time and they responded in
21 due course.

22 DR. HOROWITZ: I think the question

1 was how long between the activation of the
2 suppression system and the subsequent flash fire
3 where the workers were?

4 INVESTIGATOR BANKS: Well, the signal
5 goes out immediately.

6 MR. FRUMIN: Right.

7 INVESTIGATOR BANKS: There were
8 minutes between the activation of that alarm and
9 the discovery of the flames from the hose over
10 the mixing tank.

11 MR. HOFMANN: Mr. Banks, I don't want
12 to be in a debate, but my clients have testified
13 under oath and my clients advised that there was
14 no alarm before the major flash fire.

15 DR. HOROWITZ: Yes, I think the
16 report is in concurrence with that. But go
17 ahead, Mr. Frumin.

18 MR. FRUMIN: Okay. So I just -- well,
19 this is a little confusing and it's because there
20 is precedent for this issue that I just wanted to
21 try to clarify it. So I understand that the
22 suppression -- that the activation of the

1 suppression system triggered an alarm which,
2 among other things, notified the fire department.
3 And the question -- so whether it was audible to
4 the workers or not, that -- and it was -- that
5 occurred minutes, as you said, before the fire
6 that then hit the workers, including in the
7 control room. Am I getting that right, or no?

8 INVESTIGATOR BANKS: All of the eye
9 witness testimony that we have is their recall.
10 So when we say minutes, it's -- time gets
11 distorted when --

12 MR. FRUMIN: Okay.

13 INVESTIGATOR BANKS: -- folks are
14 under stress.

15 MR. FRUMIN: But there was some -- it
16 wasn't like instantaneous? I mean, the
17 suppression system occurred. That was activated.
18 You're not talking milliseconds here?

19 INVESTIGATOR BANKS: No.

20 MR. FRUMIN: All right. Okay. Those
21 are the only questions I had about it.

22 I want to thank you for the detailed

1 investigation. As always, we appreciate very
2 much the Board's focus on combustible dust and
3 the Board's leadership in calling attention to
4 the price that workers pay for the failure of
5 management to own up to its responsibilities to
6 design systems and to operate facilities
7 properly.

8 I think you've adequately identified
9 what's at stake by virtue of the delays in the
10 implementation of standards, whether it's
11 management's adoption of the recommendations of
12 voluntary organizations like NFPA or the failure
13 of the powers that be, whether it's the Labor
14 Department or the people who determine what the
15 Labor Department does in setting standards. So
16 we're still in a crisis here and you continue to
17 draw attention to that, so we appreciate that.

18 I do want to just mention for
19 historical context a similar event that's quite
20 important in the history of the Board. On April
21 21st it will be 20 years since another community
22 nearby suffered an incident that was as horrible

1 as this one was, orders of magnitude worse. This
2 was the incident at the NAPP Technologies plant
3 in Lodi, New Jersey that killed five people,
4 destroyed the town center, did a lot of damage to
5 the Saddle River, etcetera.

6 The Board didn't exist at that time.
7 The Board's existence was precarious at that
8 time. OSHA and EPA at that time were maintaining
9 that they could adequately investigate these
10 kinds of incidents. And to OSHA and EPA's
11 credit, after they issued their report on the
12 subject -- excuse me. And I would like to give
13 credit to the efforts that the OSHA and EPA
14 enforcement staff made to come to grips with that
15 problem. When OSHA issued its citations, they
16 acknowledged that they had no standard for
17 reactive chemicals and they couldn't cite this
18 company under the existing PSM standard. And
19 that was a terrible loss.

20 One of the problems, one of the --
21 well, the evaluation of the significance of that
22 incident had a lot to do with the Board's

1 existence, because it was after the review of the
2 OSHA/EPA report that the White House and the
3 Congress agreed that it was necessary to create
4 the Board.

5 One of the people who reviewed the
6 report that OSHA and EPA issued was Jerry
7 Scannell, a New Jersey resident, former corporate
8 safety director for Johnson & Johnson,
9 subsequently head of the National Safety Council.
10 And he pointed to some of the very -- this was in
11 1997, a couple years later. He pointed to some
12 of the very same issues that you've identified
13 today. He said, for instance, that the
14 management systems need to be examined further.
15 In fact, in the ways that you've done it, but in
16 ways that you haven't.

17 He said, for instance, that the
18 qualifications, credentials and competence of the
19 managers involved in the decision making from new
20 product review to emergency response need to be
21 examined. And then he expressed his frustration
22 with the failure of the management to comply with

1 the existing standards, whether they were
2 mandatory standards or others. He said one of
3 the recommendations is essentially that companies
4 should comply with existing rules such as in that
5 case PSM and RMP.

6 What does this change, he said? Do
7 companies not know about the rules? Don't they
8 care? Aren't they worried about the consequences
9 of non-compliance, or don't they think they will
10 get caught? Essentially is why did this company
11 ignore the law and what should be done to reduce
12 the likelihood of companies ignoring the law in
13 the future?

14 So we're in the same boat today that
15 we were 20 years ago where managements of
16 sophisticated chemical companies continue to
17 ignore their responsibility, whether they're the
18 financial managers approving requests or that
19 they're the chemical engineers or other kinds of
20 engineers. And I just wanted to place this
21 particular incident -- because we're close to it
22 geographically but also on the anniversary of the

1 NAPP incident and the importance to the Board --
2 to place this incident in context and to commend
3 the Board for drawing attention to the
4 management's safety issues, both in this incident
5 and in others that you've done because of how
6 important those are in protecting workers. Thank
7 you.

8 DR. HOROWITZ: Thank you, Mr. Frumin.

9 The next is Paul Piantino. And please
10 do spell at least your last name.

11 MR. PIANTINO: Sure. Good evening.

12 Piantino, P-I-A-N-T-I-N-O.

13 Mr. Chairman, Board, I'm a partner at
14 the law firm of White and Williams. I have the
15 privilege and honor of representing one of the
16 injured workers in connection with this incident.
17 For the sake of brevity I just want to note for
18 the record that I join in the comments of Mr.
19 Hofmann that he's already noted and placed on the
20 record here this evening.

21 I did have a couple of discrete
22 questions separate and apart from the issues that

1 have been raised by Mr. Hofmann. I note that
2 earlier in the evening there was a slide by Ms.
3 Shroff. I think she's left the dais, but I know
4 Mr. Banks is aware of all of the details of this
5 investigation as the chief investigator. The
6 slide that Ms. Shroff put up indicated a
7 quote/unquote "heavy reliance" by outside
8 contractors. Mr. Hofmann alluded to this
9 briefly, I think, in his comments.

10 Did the CSB consider its charge to
11 include an analysis of the contracts and the
12 letters of engagement between US Ink and the
13 various vendors, dust collection experts and fire
14 suppression experts that it engaged? It seems
15 readily apparent that US Ink was in the black ink
16 business for purposes of manufacturing black ink
17 for newspaper printing. And like many of us,
18 when you get into an area requiring specific
19 expertise, you ask the experts.

20 So I noted a lack of reference to the
21 vendors and the experts in dust collection and
22 fire suppression in the report. It may have been

1 purposeful. So all I'm trying to ascertain is
2 did the CSB believe it was within the scope of
3 its charge to evaluate what US Ink had contracted
4 with others to handle by way of receiving
5 recommendations, advice, counsel, and of course
6 ultimately purchase and installation services?

7 So in the absence of Ms. Shroff, you
8 know, Mr. Banks, I --

9 DR. HOROWITZ: Yes, I think the report
10 makes the point that US Ink did not provide
11 adequate oversight of contractors involved in the
12 installation of the system. I guess the caution
13 I would make is the CSB report and its
14 recommendations are in no way seeking to
15 apportion responsibility for the accident among
16 US Ink and any other parties who were involved
17 from a prevention standpoint. We direct the
18 recommendations, the proposed recommendations to
19 US Ink simply because they are the party that
20 owns the system, in the future is responsible for
21 its safety. So we certainly understand the kinds
22 of comments you and the other attorney for

1 victims are raising and I would just say we are
2 not apportioning responsibility from the parties
3 by who we describe them in the report.

4 MR. PIANTINO: Okay. So it's a fair
5 reading then that where we might see certain
6 references to US Ink that that could
7 interchangeably be interpreted as being not only
8 US Ink W-2 employees or full-time employees, but
9 agents or contractors that they have retained?
10 That's a fair inference?

11 DR. HOROWITZ: It's strictly a safety
12 analysis, so we looked at who in the future would
13 be in a position to prevent the accident.

14 MR. PIANTINO: And, Mr. Banks, I
15 gather you agree with that?

16 PARTICIPANT: We're going to have to
17 hold off on that type of -- the staff doesn't
18 answer questions per se and they make their
19 presentations, they certainly receive public
20 comment, but they are not here to answer their
21 assessment or evaluations of the report
22 themselves. They may, to a limited extent, have

1 answered some very factual questions, but in
2 terms of their own assessment, the report stands
3 for itself.

4 MR. PIANTINO: Right. Yes, and I
5 think our moderator has answered the question,
6 but I'm trying to just ascertain what really the
7 scope of the investigation was. And I think he's
8 answered the question, so we can move on.

9 Again, one of the other interesting
10 elements of the report, again not having a full
11 opportunity to review it prior to this evening,
12 is an indication that the flash fire, the second
13 flash fire in or around tank 306 had caused the
14 injuries that these individuals had sustained.
15 And that, according to page 14, seems to have
16 been brought about by the increased pressure in
17 the duct work which led to a discharge of the
18 suppression system.

19 And my question to Mr. Banks or anyone
20 who was part of the investigation is whether or
21 not there was any consideration given to the fact
22 that while the suppression system may have

1 prevented further damage to equipment,
2 particularly equipment on the roof, if it may
3 have actually hastened or caused the flash fire
4 which ultimately was the decisive force that
5 injured these gentlemen? And was there any
6 investigation into the suppression system in this
7 case doing more harm to human life than good?

8 INVESTIGATOR BANKS: Well, I think the
9 absence of a fire suppression system in the duct
10 work is captured in our examination of this
11 event. The explosion suppression system inside
12 the dust collector was designed to suppress an
13 explosion or deflagration. And when there was a
14 pressure registered, the explosion suppression
15 system performed. We examined inside the dust
16 collector post-incident. We removed the filters
17 and we could observe where the suppression
18 activated the nozzle, the indentation that it
19 left on the filters themselves. It was pretty
20 clear that that performed as designed. The
21 absence of a suppressant for fire in the duct
22 work is something that, as I said, we captured in

1 the report itself.

2 MR. PIANTINO: Did the CSB draw any
3 conclusions as to whether or not the discharge of
4 the suppressing agent and increasing the pressure
5 in the duct work itself though may have hastened
6 the flash fire itself?

7 INVESTIGATOR BANKS: I would say --

8 CHAIRPERSON MOURE-ERASO: I'm sorry,
9 I have to interrupt this train of questions. The
10 report speaks for itself. You can read the
11 conclusions, the findings and the
12 recommendations. I mean, if you are trying to
13 elicit some new facts here, what I suggest is
14 that you read the report. And we stand by it.

15 MR. PIANTINO: Okay.

16 CHAIRPERSON MOURE-ERASO: And that is
17 what the object of the report is that, to present
18 our recommendations. I don't think that we can
19 second-guess it right now in this meeting through
20 public comment.

21 MR. PIANTINO: Yes, thank you,
22 Chairman. I'm not second-guessing the report in

1 asking these questions, but some of them are more
2 of clarification. But I thank the Board for its
3 time. Thank you.

4 DR. HOROWITZ: Thank you.

5 CHAIRPERSON MOURE-ERASO: Thank you.

6 DR. HOROWITZ: Is there anyone in the
7 audience who didn't sign up who would like to
8 speak? John Morawetz?

9 MR. MORAWETZ: Mr. Chairman, the Board
10 and the staff, what I mentioned earlier was
11 exactly the kind of --

12 DR. HOROWITZ: John, could you say
13 your --

14 MR. MORAWETZ: Again?

15 DR. HOROWITZ: -- spell your name once
16 again?

17 MR. MORAWETZ: M-O-R-A-W-E-T-Z.

18 DR. HOROWITZ: Thank you.

19 MR. MORAWETZ: This is exactly the
20 kind of report that I think is -- what I
21 mentioned earlier, that we use in training
22 programs, we talk to our local unions about.

1 It's a root cause analysis. Very thorough
2 recommendations, which are really good.

3 I'm here more on this report for the
4 Chemical Workers Union because we do represent
5 about three or four facilities that manufacture
6 carbon black. So it is of interest, the ins and
7 outs of this. A very thorough investigation,
8 that it wasn't, as far as I can tell, a simple
9 carbon black situation. Still lessons to be
10 learned.

11 I have four minor questions, or I can
12 make them as points. One is actually on the
13 slide up there. Is there a particular reason why
14 this recommendation to the company, the only one,
15 is oriented only to new personnel, not new and
16 existing personnel, and why there's an "or" for
17 initial and refresher? It's one thing we've seen
18 continually is it has a communication. It's a
19 one-shot deal training. If conditions don't
20 change, workers do not get any refresher training
21 unless another standard is triggered. So I don't
22 know if there's a particular reason. It's a

1 really minor point, but I would hope you would
2 consider it in the future.

3 DR. HOROWITZ: I think it can be read
4 as "initial and refresher training." Perhaps it
5 was a poor choice of word.

6 MR. MORAWETZ: No. 2, as the gentleman
7 spoke from the trade organization on construction
8 and building construction, I think that's a
9 really -- it shows the far-reaching effects of
10 your recommendations. Whether it's required or
11 not, people pick up on them, they read about
12 them, they try to make the right improvements.
13 And it's something I think of benefit.

14 Is there a trade organization that
15 covers the SIC codes that you identified for ink
16 product manufacturing?

17 DR. HOROWITZ: There is an association
18 of print ink manufacturers. I believe there is a
19 gentleman here at the meeting.

20 MR. MORAWETZ: So what I'm thinking
21 about; and again not necessarily to amend this
22 report, but as something to go in the future,

1 it's been a strength of other reports that it has
2 these far-reaching recommendations to other
3 applicable organizations, that they should to
4 hazardous analysis, management of change and do
5 that analysis.

6 Three, you mention in Section 6.3 the
7 hazard communication and evacuation plan, but
8 there's no particular mention of the OSHA
9 standards that govern that. Not that that's your
10 responsibility; that clearly is OSHA's, but it
11 would seem to me this is an opportunity to
12 mention and reference applicable OSHA standards.
13 Is there a particular policy on CSB about
14 mentioning or not mentioning other standards?

15 DR. HOROWITZ: Not to my knowledge.

16 MR. MORAWETZ: Okay. A suggestion in
17 the future.

18 Last but not least, I stand here also
19 as a member, a board of director of the American
20 Conference of Governmental Industrial Hygienists,
21 and it's good to see the use, as we know industry
22 uses the Industrial Ventilation Manual. There

1 also is -- it's one of the major courses that we
2 do regularly, is put on industrial ventilation
3 classes. So I don't know where that would go in
4 terms of interaction between the CSB and ACGIH,
5 but I think that is an opportunity for
6 collaboration and joint work that we should both
7 look into.

8 DR. HOROWITZ: Well, we appreciate
9 that and any context you could help us in terms
10 of the distribution of this work or further
11 education efforts we'd be very, very interested.

12 MR. MORAWETZ: We'll be in contact.

13 DR. HOROWITZ: Thank you. Any others?

14 (No audible response)

15 CHAIRPERSON MOURE-ERASO: Thank
16 everybody for its comments. And we now proceed
17 to the vote. I am prepared to hear motions on
18 this report and this case study.

19 MEMBER GRIFFON: Mr. Chairman, I'll
20 make a motion. I move that the Chemical Safety
21 Board approve Report No. 2013-01-I-NJ, titled,
22 "Ink Dust Explosion and Flash Fires in East

1 Rutherford, New Jersey at the US Ink/Sun Chemical
2 Corporation That Occurred on October 9th, 2012,"
3 including all findings and recommendations
4 contained or referenced in the case study.

5 CHAIRPERSON MOURE-ERASO: Is there a
6 second?

7 MEMBER EHRLICH: I'll second that
8 motion, Mr. Chairman.

9 CHAIRPERSON MOURE-ERASO: So I will
10 ask is there any discussion among the Board,
11 further discussion on the case report?

12 (No audible response)

13 CHAIRPERSON MOURE-ERASO: Hearing
14 none, I will call the question, and I ask the
15 general counsel to proceed.

16 DR. HOROWITZ: The question on the
17 motion is the approval of the report just
18 referenced by Member Griffon, so I will call the
19 roll accordingly. Mr. Ehrlich?

20 MEMBER EHRLICH: I vote in favor.

21 DR. HOROWITZ: Mr. Griffon?

22 MEMBER GRIFFON: I vote in favor.

1 DR. HOROWITZ: Mr. Chairperson?

2 CHAIRPERSON MOURE-ERASO: I vote yes.

3 DR. HOROWITZ: In that case, the
4 report has been duly adopted.

5 CHAIRPERSON MOURE-ERASO: Our business
6 is almost done. I only have a closing statement.

7 I would like to reiterate that the
8 message of this report is that we are summarizing
9 our findings in the recommendations, and that we
10 propose a total of eight safety recommendations
11 that are very specific that include
12 recommendations the U.S. Occupational Safety and
13 Health Administration, the State of New Jersey
14 and the US Ink Company. Let me emphasize part of
15 those recommendations.

16 First, we are reiterating a call to
17 OSHA to issue a comprehensive combustible dust
18 standard to follow the guidelines that are
19 already state-of-the-art in the control of
20 combustible dust on the National Fire Prevention
21 Association to include those.

22 We also ask OSHA to add the printing and the

1 ink manufacturing facilities to the list of
2 industries that are part of the Combustible Dust
3 National Emphasis Program.

4 To the State of New Jersey we also
5 made recommendations to the New Jersey Uniform
6 Construction Code, to the New Jersey Department
7 of Community Affairs to address issues that you
8 saw the details in the presentations.

9 And finally, we made recommendations
10 to the US Ink specifically to install automatic
11 fire alarm systems consistent with the National
12 Fire Prevention Association Guidelines and also
13 to address the issue of training workers on these
14 facilities and the training that should include
15 not only the original training course, but
16 refreshers that we specifically make in our
17 recommendations.

18 So those are the messages of this
19 report and that we would like everybody to carry
20 on.

21 I would like also to thank Mr. Griffon
22 and Mr. Ehrlich for their participation in

1 today's meeting. All of us share a strong
2 interest in preventing these tragic explosions
3 from occurring. Our hope is to make sure that
4 workers, that the communities and the emergency
5 response personnel are not forced to experience
6 an incident similar to the two discussed here
7 today. In the next few months the CSB will be
8 working with recommendation recipients to create
9 safer working environments and communities.

10 I would like also again to thank all
11 the participants, especially the people that
12 participated in the public meeting with their
13 comments. And with that, I declare this meeting
14 adjourned.

15 (Whereupon, the above-entitled matter
16 went off the record.)

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